

INTELLISPEC™

System Guide Series V FHCP 3X

Pressco Technology Inc.

70749 Rev. 01



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 15) 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 5.1.021, 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.

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.

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.

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 USE POWER SWITCH AT MAIN SHUT OFF FOR CONTROLLED SHUT DOWN OF VISION SYSTEM	This warning about the power switch is located on the FHCP 3X module. Use the main power switch DISC 1 to shut down the entire system. Power On/Off (on page 23) Use the power switch on the FHCP 3X module only if you need to service the module.

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 11).

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 335).



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.

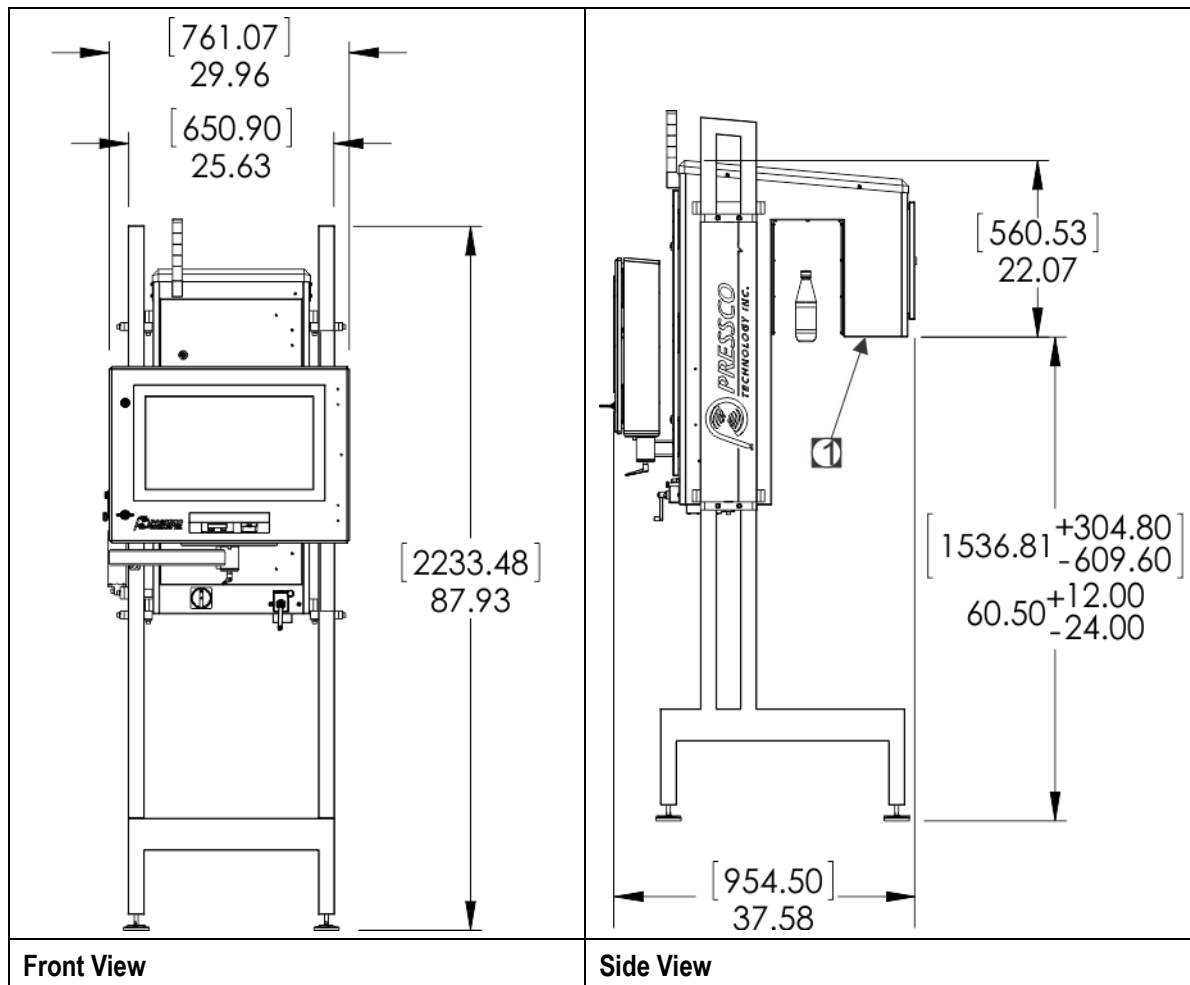
To obtain a spare parts list, contact the customer service department at Pressco. **How to Contact Pressco** (on page 335).

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

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 without light tree)	87.93 inches [2233.48 mm]
Height (from conveyor to top of module)	22.07 inches [560.53 mm]

Measurement	Value
Height (from floor to conveyor) Adjustable	60.50 inches +12 in./ -24 in. [1536.81 mm +304.80 mm / -609.60 mm]
Width (of User Interface)	29.96 inches [761.07 mm]
Width (of stand)	25.63 inches [650.90 mm]
Depth	37.58 inches [954.50 mm]

PART AND PART HANDLING SPECIFICATIONS

Closure/ Finish Size

The range of cap/finish sizes that the FHCP 3X system will handle are: **25mm - 43mm** Outer Diameter. Sports caps and other specialty caps must be evaluated by Pressco Technology Inc. prior to inspection.

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, a **minimum space** between bottles of approximately **40mm** is desired. If this spacing is not achievable, narrower spacing will be evaluated on a case by case basis by Pressco Technology Inc.

FILL CAMERA SPECIFICATIONS

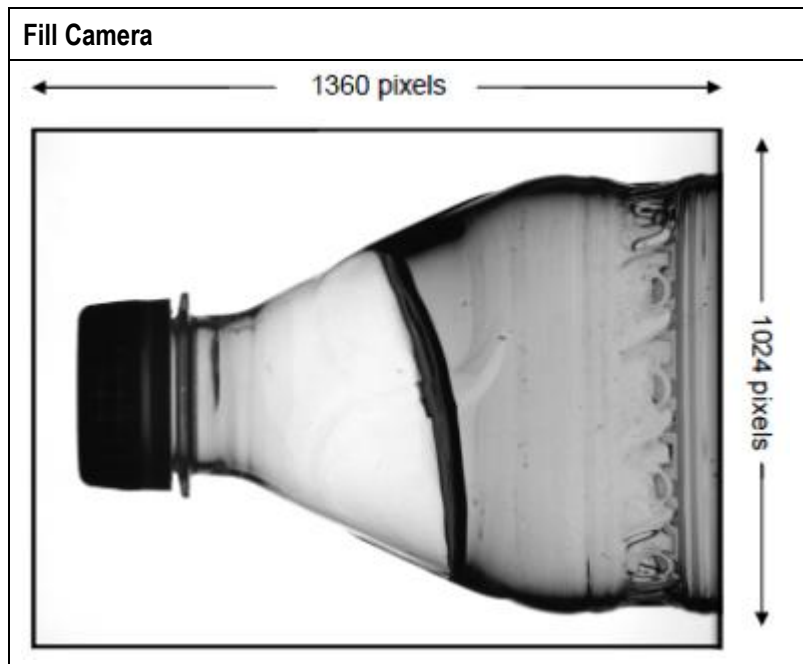
The Fill camera uses a high resolution monochrome camera to inspect with high precision for both fill height and cap placement defects. It uses a telecentric lens to ensure consistent imaging from part to part. This camera can only see infrared (IR) illumination from the main camera backlight; it has an IR bandpass filter in front of the CCD.

Specifications:

- 1360 x 1024 pixel resolution
- Monochrome
- CS-Mount
- 1/3" CCD
- IR Bandpass Filter
- 5mm Spacer
- Telecentric lens
- No aperture settings (lighting menu adjusts illumination)

Field of View:

The high resolution main camera view can be rotated so that the bottle can be upright in the image, or turned on its side (as seen below). The long axis of the camera will be used to allow for coverage of fill heights that are lower down the sidewall of the bottle, and also for larger containers.



Telecentric Lens



COLOR CAMERA SPECIFICATIONS

There are two color cameras that focus on the cap to provide 360 degree inspection for various defects. The color cameras also provide the ability to differentiate part types based on cap or bottle color. These cameras use both front and back lighting to see a silhouette of the cap while also seeing the front surface of the cap.

Specifications:

- 640 x 480 pixel resolution
- Bayer Filtered Color
- C-Mount
- 1/2" CCD
- IR Block Filter
- 5mm Spacer
- 35mm lens

Field of View:

The color cameras can be adjusted to move closer to or further from the part based on part size. The initial setup has the camera moved as far away from the part as possible.



Chapter 4

OPERATING THE FHCP 3X SYSTEM

POWER ON/ OFF

Power on

To turn the power on to the Intellispec FHCP 3X system, turn on the main power switch (DISC 1, shown in the illustration below). The system will start, and the Intellispec software will load. Log in to begin using the system.

Power off

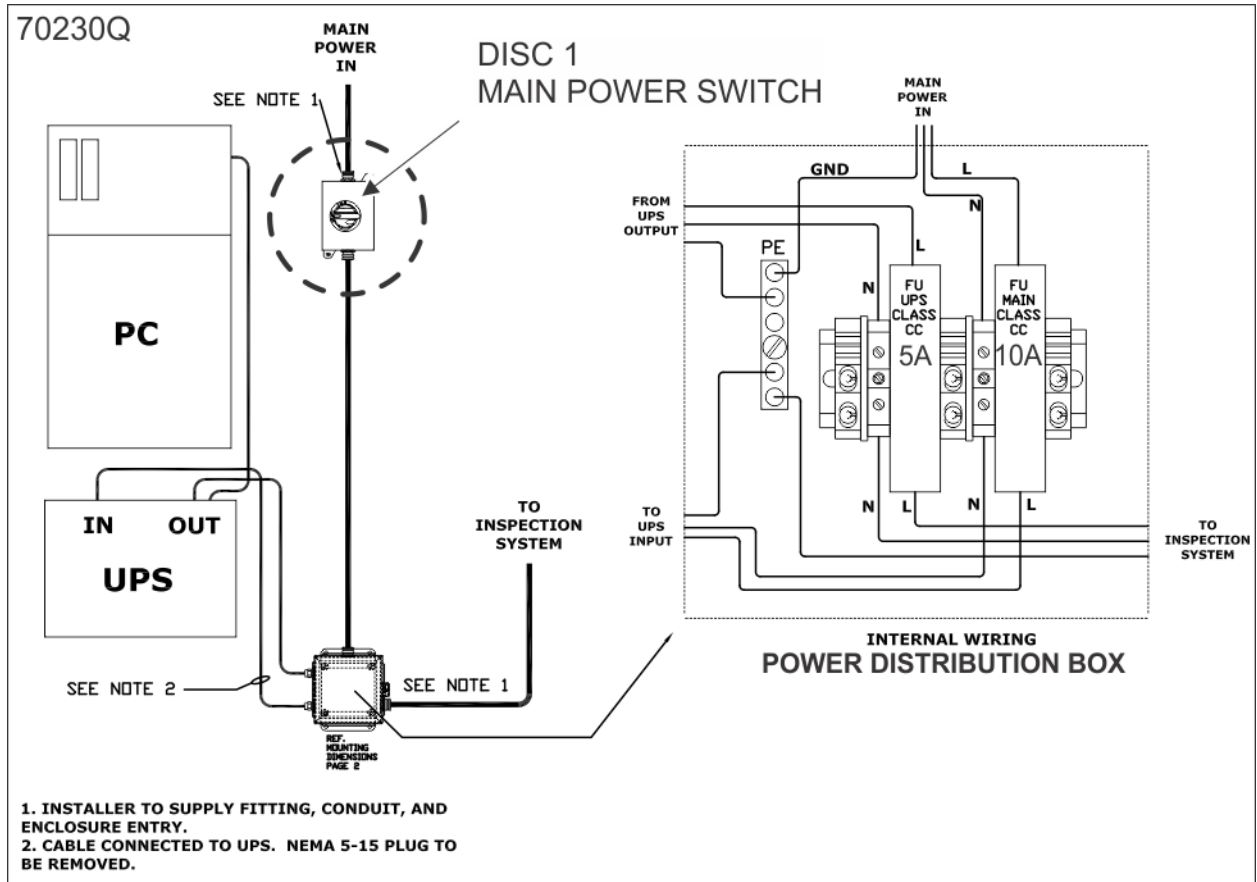
To turn the power off to the Intellispec FHCP 3X system, turn off the main power switch (DISC 1). The system will shut down, including a controlled shut down of the software.



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.

The illustration below shows DISC 1 in relation to the other system components. The actual location of DISC 1 in your plant may vary.



NOTE: make sure the following switches are in the ON position. Normally you can leave these switches ON all the time.

- **FHCP 3X Module Power Switch** (on page 258)
- Power switch on the Intellispec Computer Enclosure.
- Power switch on the UPS, located near the computer, or inside the NEMA 4X enclosure. See the location of the power switch for the computer and UPS that applies to your system:
 - **Computer Enclosure Standalone components** (on page 276)
 - **Computer Enclosure NEMA 4X components** (on page 282)

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.

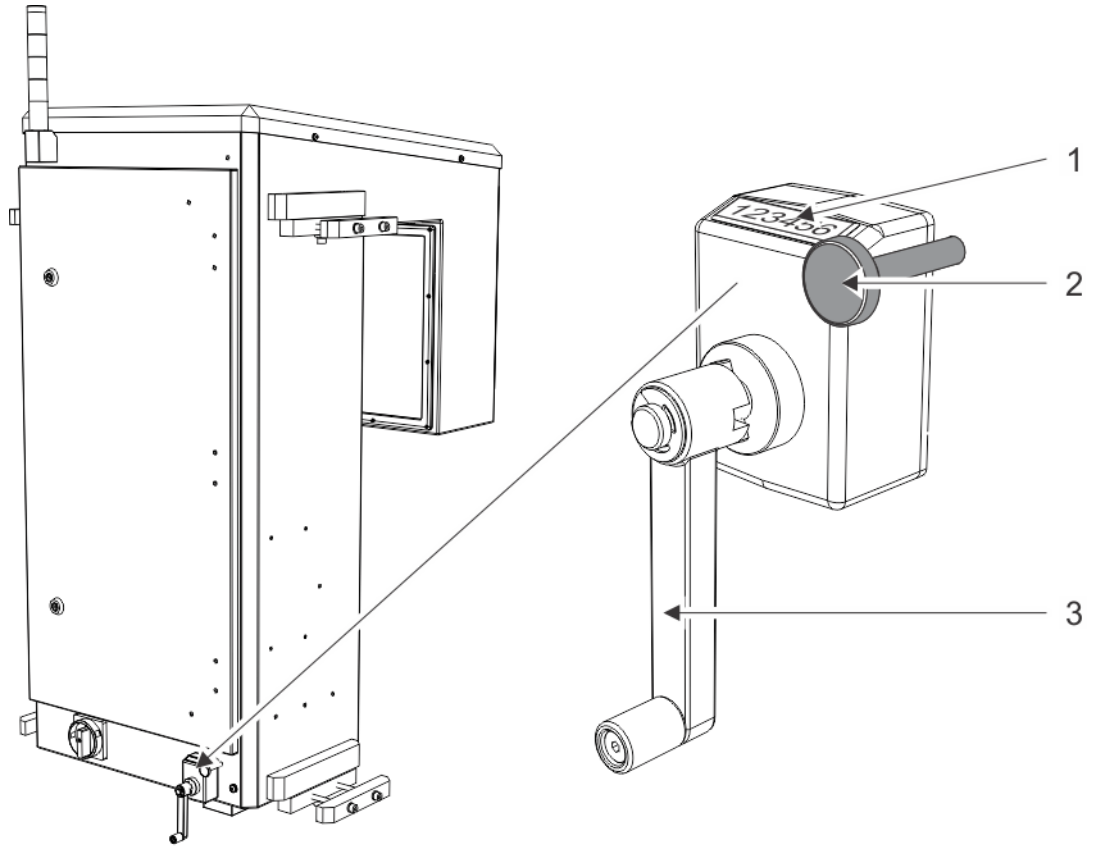
PART CHANGEOVER ADJUSTMENT

When changing parts to inspect, you may need to:

- Change the module height, and
- Change the **part program** (see "**Part Changeover**" on page 26)

Use the convenient hand crank to change the height of the module for a different part size. If you are inspecting the same part size, then you do not need to move the module. The part detector and sensor move along with the cameras. They are part of the moving camera assembly.

The hand crank allows for approximately 18cm [7 inches] of vertical movement.



1	Number display
2	Removable stop
3	Hand crank

To change the module height:

1. Make sure the conveyor is STOPPED.
2. Loosen and remove the removable stop [item 2] to be able to move the hand crank.
3. Turn the hand crank [item 3] until the module is in the desired position. If you have previously recorded the number [item 1] associated with the part you will be inspecting, then turn the crank until the correct number appears. See **Part Adjustment Table** (on page 25).
4. Replace and tighten the removable stop [item 2].

The inspection module is ready for inspection. Change the **part program** (see "**Part Changeover**" on page 26) if necessary.

Part Adjustment Table

We recommend that you write the adjustment display number [from item 1] in this table after you set up the part the first time. Refer to this table the next time you change parts and use the display number set previously. (Example: Part Type = 33ml bottle; Adjustment display number = 123456)

Part Type	Adjustment display number

Part Changeover

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

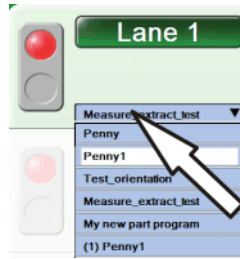
❖ *Note: Some menu items are only available to advanced level users.*

What you need:

- User permission to "Switch Part Program"

To change parts:

1. **Log in** (see "**Logging in and logging out**" on page 45).
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, Measurements	All Inspections will be contained in your Part Program. Also, parameter changes are saved for each Part Program.

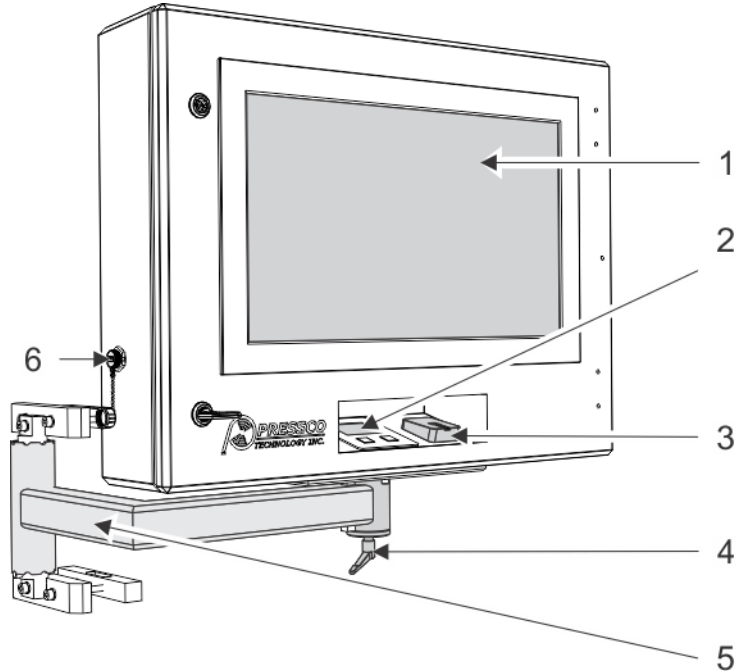
USER INTERFACE OVERVIEW

The FHCP module has a user interface that attaches to the module through a movable arm. The arm has several stops to position the monitor in almost any position. You can rotate the monitor around, or place the monitor against the module. The hardware mount provides the option of placing the monitor on the opposite side of the module, if necessary for your configuration.



Navigation Components

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



The monitor housing contains:

	KVM (keyboard, video, mouse) switch. Internal - not shown.
1	User interface monitor. Touch Screen Monitor (optional) (on page 33)
2	Glide pad with buttons to move cursor and select items on the screen.
3	Biometric login device (on page 33) (optional)
4	Handle to lock monitor in place
5	Adjustable arm
6	USB convenience port

User interface input devices

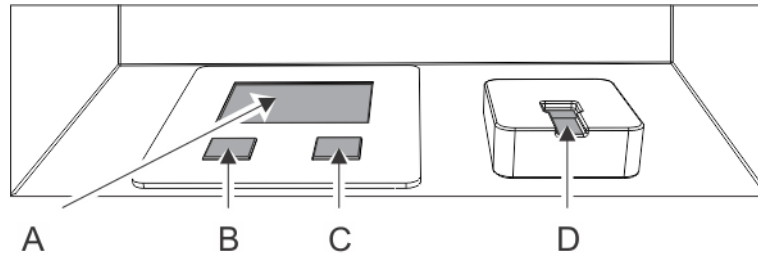
The following devices are available to input information to the Intellispec system:

- Glide pad and buttons
- **On Screen Keyboard (OSK)** (on page 30)
- **Touch Screen monitor (optional)** (on page 33)
- Temporarily connected conventional **Mechanical Keyboard (MKB)** (on page 32)
- **Biometric login device** (on page 33)

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 is located next to the **Biometric login device** (on page 33), 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.

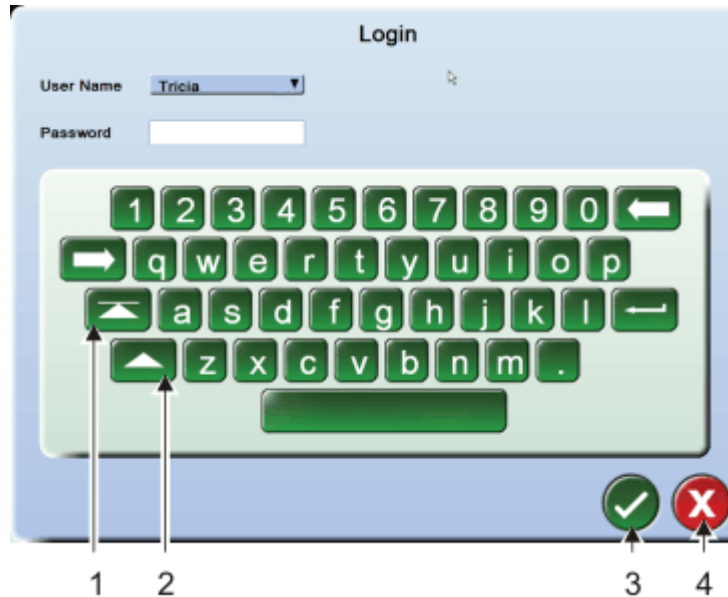
Item	Action	Result
A	Point (move pointer with the glide pad)	Display Tool Tip when hovered over active object
B	Click (Left-click)	When the pointer is over an active object, a click initiates various actions. Nothing happens when the pointer is clicked on a disabled object.
B, B	Double-click	When the 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 (Biometric login device on page 33))	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

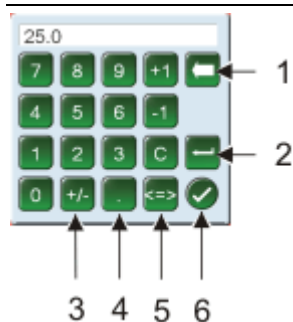


1	Shift lock button - capitalizes all letters until you press this button again.
2	Shift button - capitalizes one letter, then returns to uncapitalized letters automatically.
3	OK button - accepts the typed information and closes the keyboard screen.
4	Cancel button - disregards the typed information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

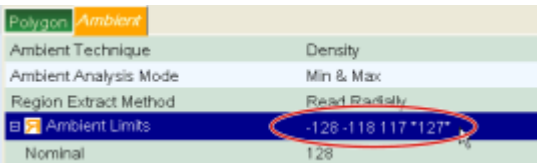
NUMERIC KEYBOARD

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 257). 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 29).

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 182)
- ***Exporting user accounts*** (on page 50)
- ***Importing user accounts*** (on page 51)
- ***Creating a Support Package*** (on page 138)
- Using the ***Mechanical keyboard*** (see "***Mechanical keyboard (MKB)***" on page 32)
- Saving images, especially to send with a support package (***How to Save Images*** (on page 163))

Biometric login device

The **Biometric Identification login device** (see "**Adding a user with the biometric login device**" on page 48) is used to log in and out of the Intellispec system. This device is optional and must be purchased with the system.

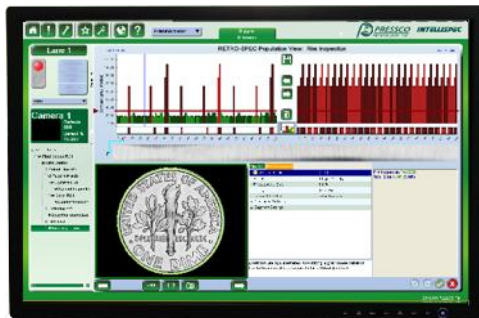


To log in with this device, press your finger to the device. The following are conditions for use:

- 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 30))

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:

System Overview

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.

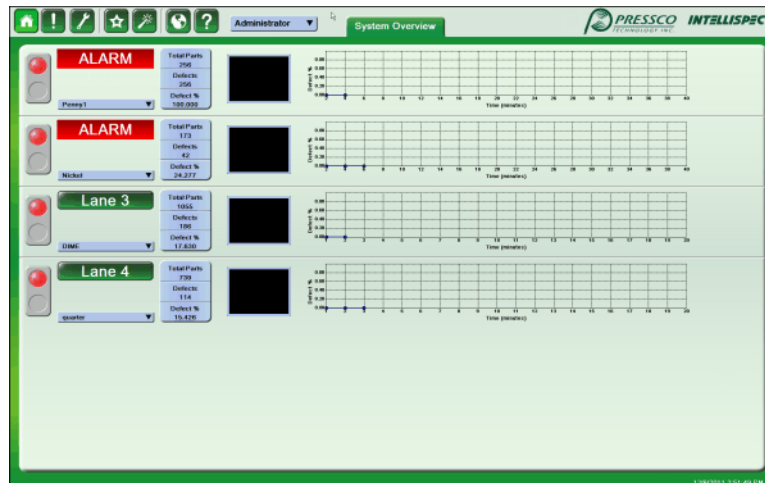
❖ *Note: when you switch between System Overview and Lane Overview modes, you will see one screen 'minimize' to the task bar while your selected screen is displayed. This is normal.*

To view the four viewing levels:



1. Click the Home button to go to level 1, System Overview.

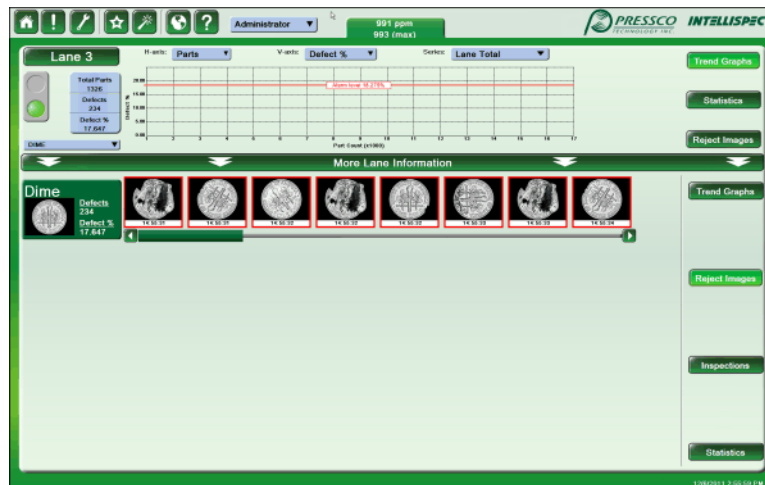
- System Overview - Displays information that represents the complete system as well as a thumbnail line for each Lane that is configured. More information about the **System Overview screen** (on page 36).



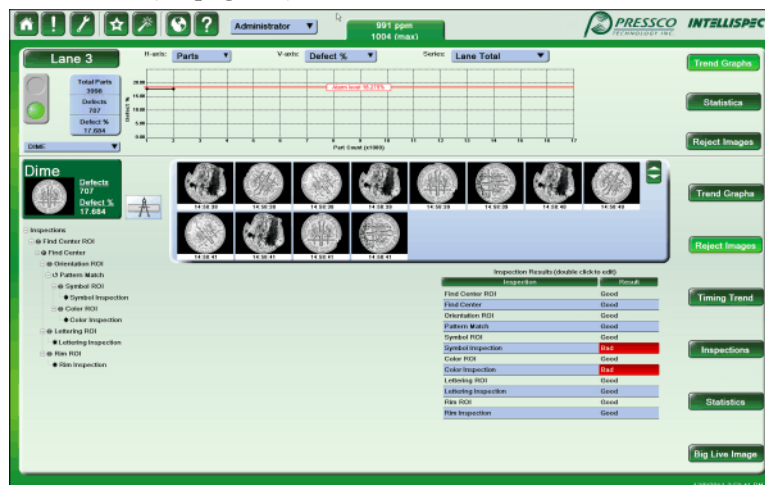
Lane n

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 37).



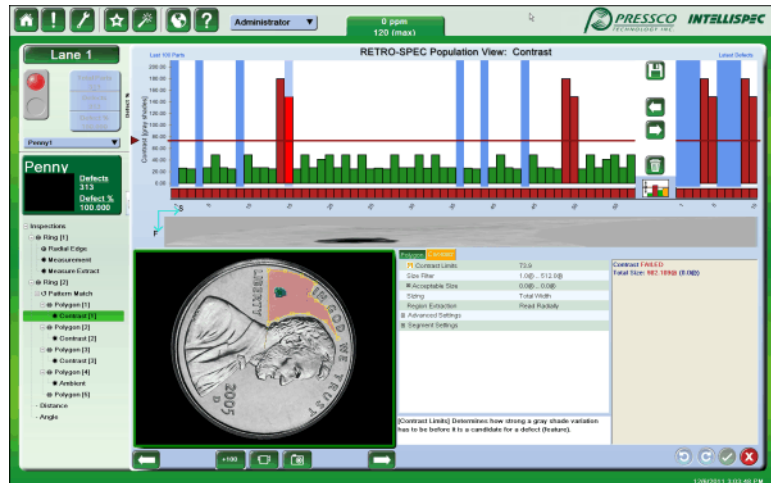
3. Click a Sensor button to go to level 3, Sensor Overview.
 - Sensor Overview - Displays information for a particular sensor, including an image area, sensor statistics, a graphics area that displays user-selectable graphs, and a user-selectable inspection list. More information about **Sensor Overview 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.

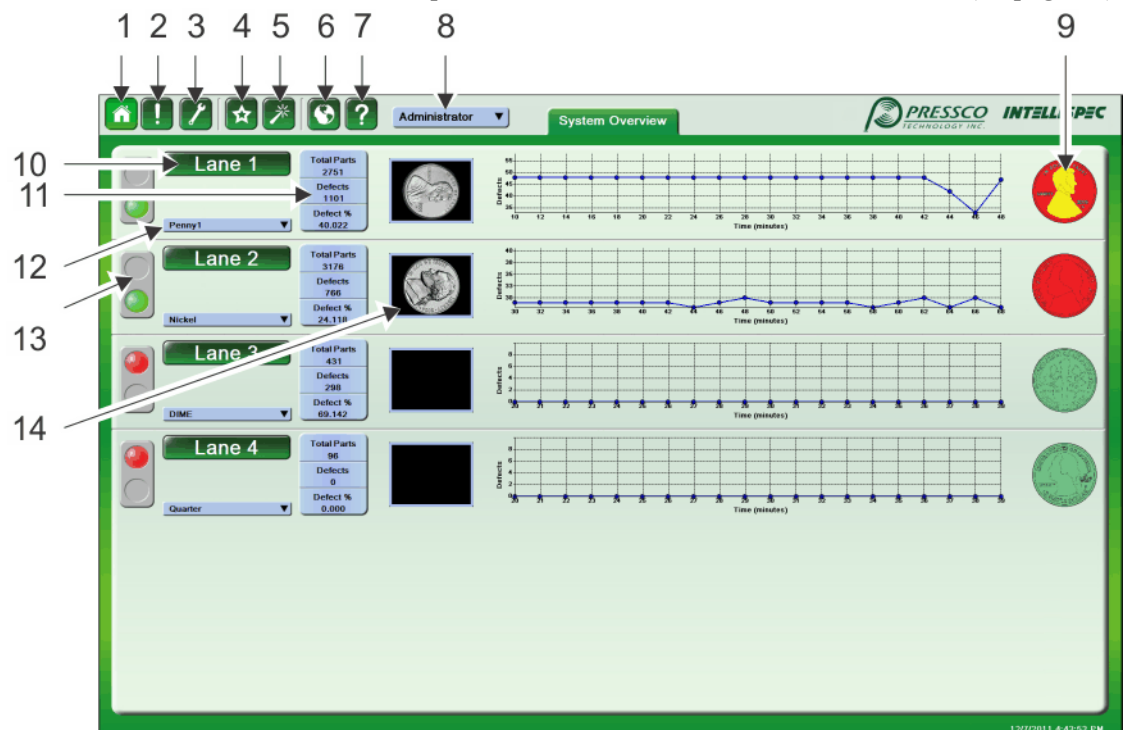
- Inspection Screen - Double-click on any inspection name to see this view, which allows you to see inspection parameters and make changes if necessary.



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

System Overview screen

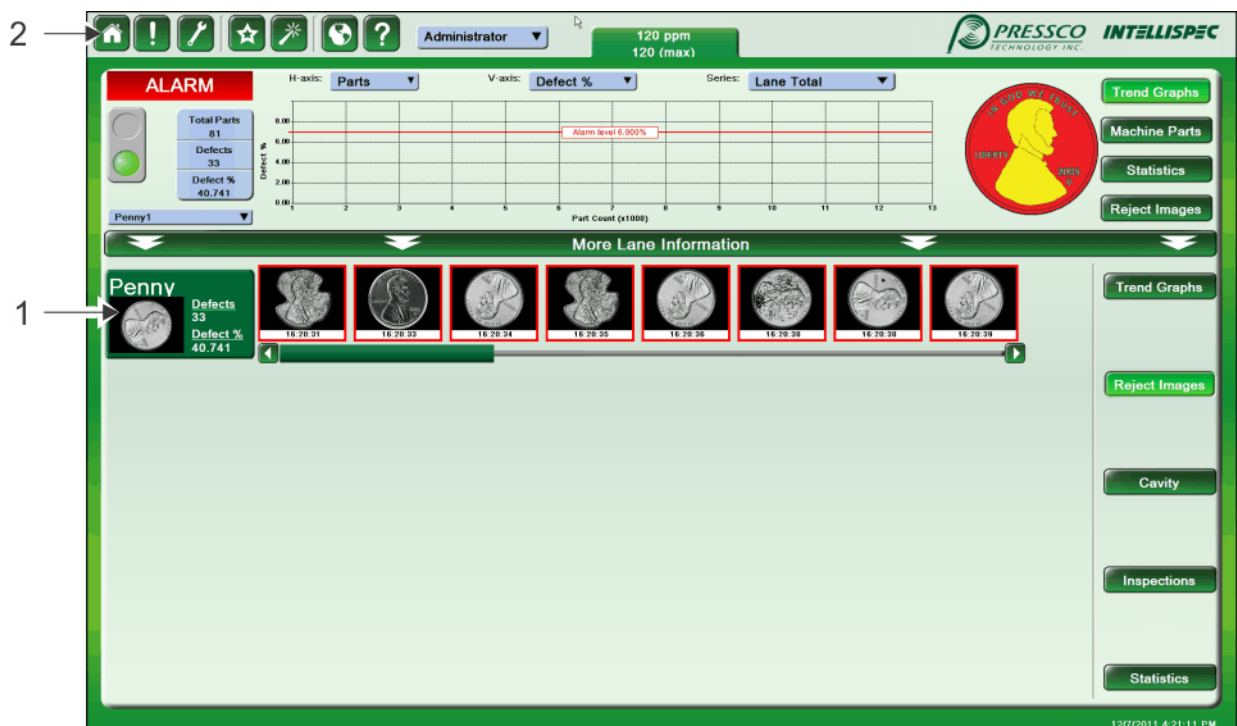
For a description of the toolbar icons, see **Menu Toolbar** (on page 40).



1	Home
2	Alarms
3	System Settings
4	Favorites
5	Wizards

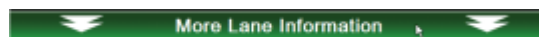
6	Language
7	Help menu (Remote support only at System Overview)
8	Log in
9	Walk By Graphic
10	Click to go to Lane Overview
11	Lane Statistics
12	Current Part Program
13	Online/ Offline
14	Heartbeat Image

Lane Overview Screen



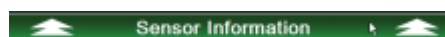
1	Click the sensor button to toggle to detailed Sensor View and back
2	Switch to System Overview

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.
2. 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.

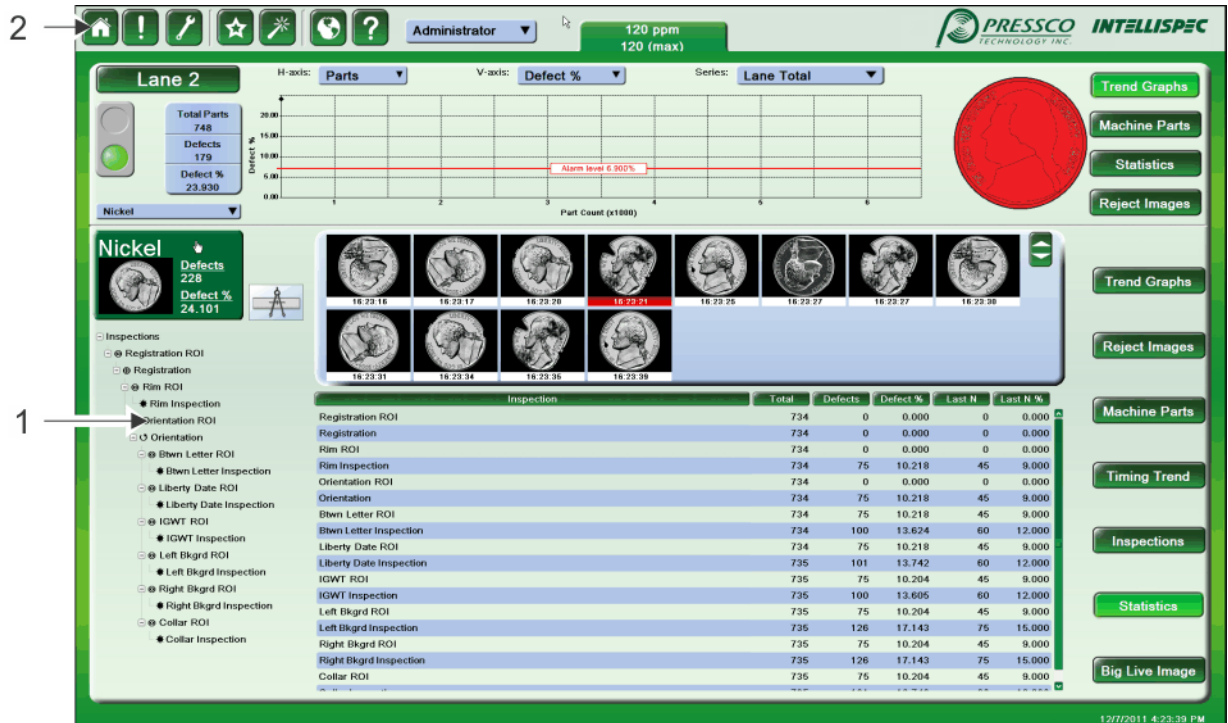
Print Lane Report

Send the lane statistics report to the default configured printer.

Statistics Last Reset

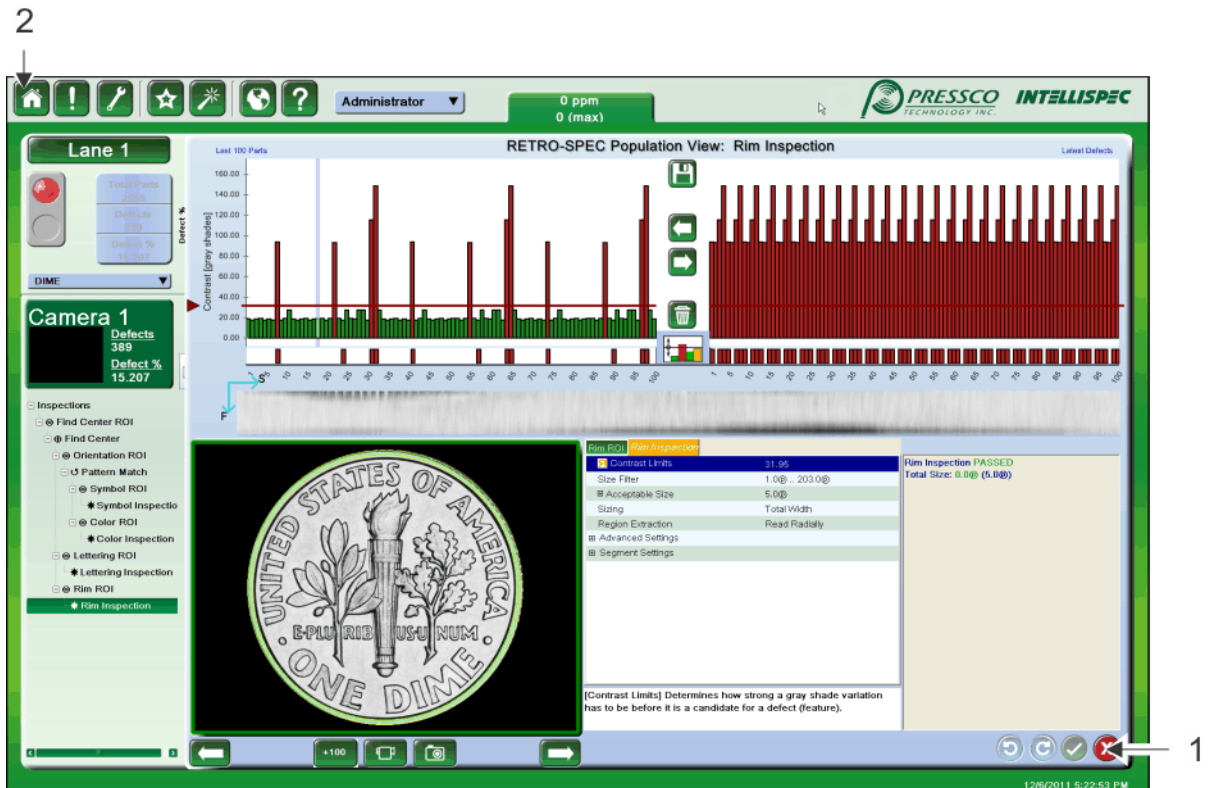
Display the date and time when the lane statistics were last reset.

Sensor Overview Screen



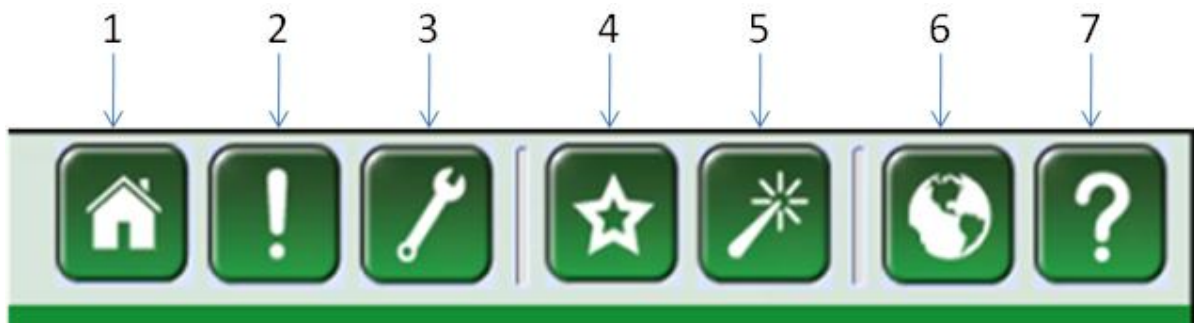
1	Double-click to open Inspection View
2	Switch to System Overview

Inspection Overview Screen



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.

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.

Favorites

From the Lane and Sensor Overview screens, you can select between Print Screen and Defect Database.

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 (when available).

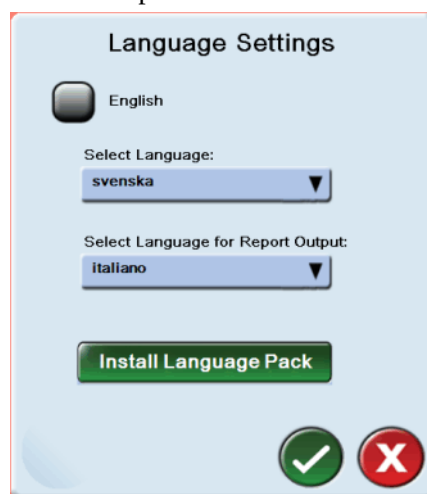
Help

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 checkbox

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:

- access Pressco **remote support** (see "**Help - Remote Support**" on page 141)
- **create a support package** (see "**Creating a Support Package**" on page 138)
- obtain your current software version, or
- use the help files.

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.

FHCP 3X LIGHT TREE

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



1	Heavy duty stainless steel enclosure housing
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

Light color	Condition	What it means
Amber	Off	No warning (OK)
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:

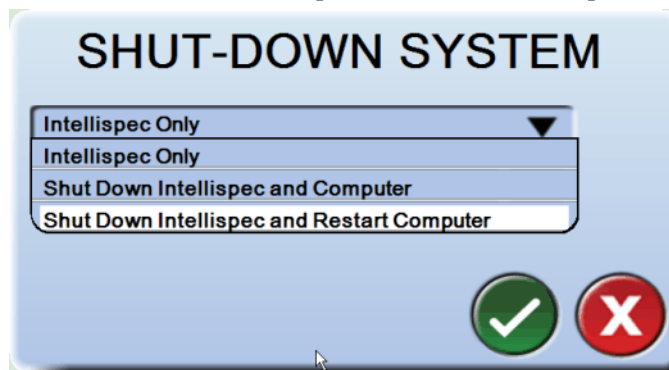
1. Log in.



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 only
 - Shut down the Intellispec and computer
 - Shut down the Intellispec 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 5

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

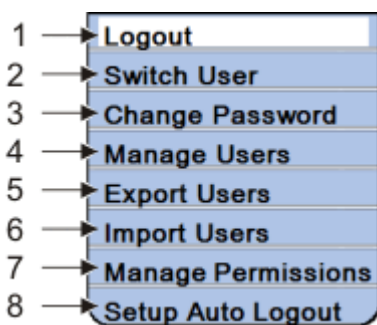
To ensure that only authorized users perform certain changes to the system, users are required to log in*.

❖ *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.

- 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 47)- Allows you to change only your password
4	Manage Users (see " Managing user accounts " on page 47) – 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 52).
5	Export Users (see " Exporting user accounts " on page 50) - Allows you to export user profiles from one Intellispec to another
6	Import Users (see " Exporting user accounts " on page 50) - Allows you to import user profiles from one Intellispec to another
7	Manage Permissions (see " Managing Permissions " on page 52) – 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 57)– This feature will automatically log you out if there is no activity for a defined amount of time

*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 52).

❖ *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:

- Click the Log in button (which has the current user's name displayed).
- Select Switch Users from the menu.
- Select the new user name from the drop-down menu.
- 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.
7. Click the OK button  to accept the changes. The dialog box closes and your password is changed.

MANAGING USER ACCOUNTS

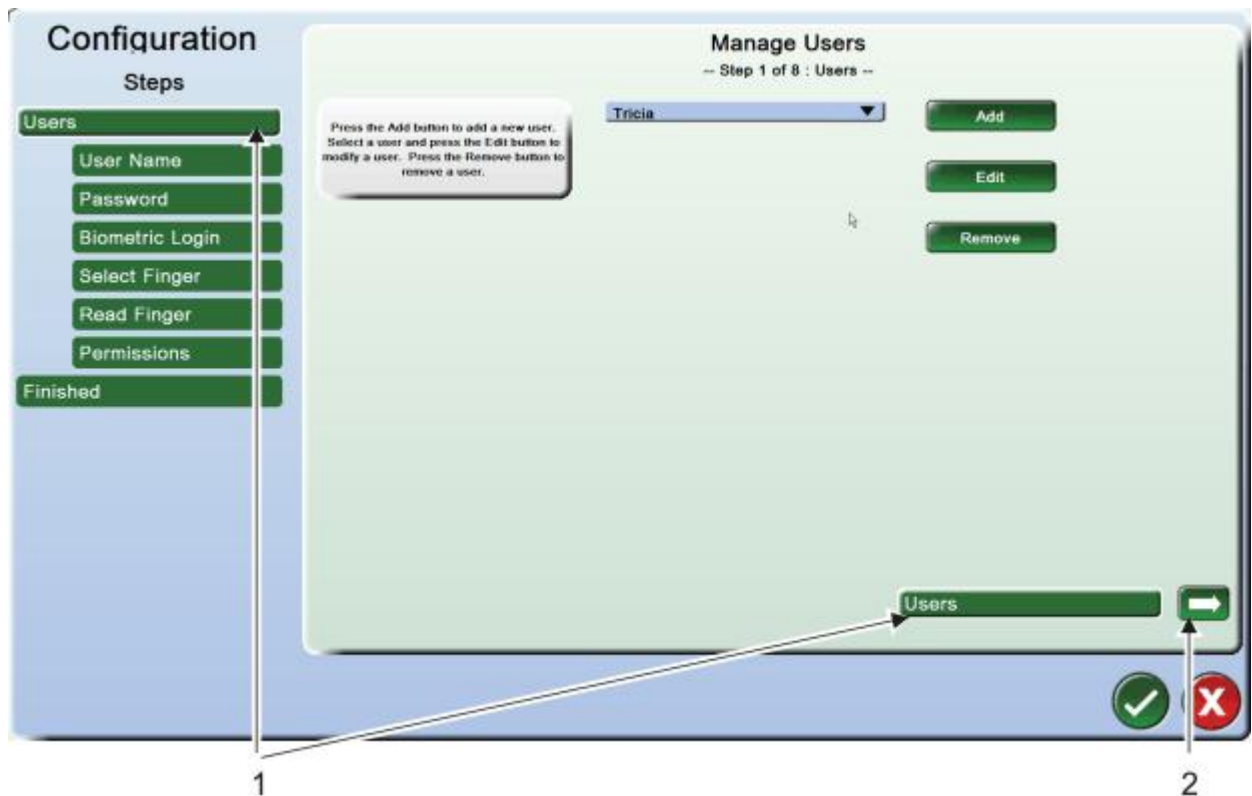
The Manage Users button is only available to those with the Manage Users permission. This feature provides a wizard that allows you to Add a new user, Edit a current user or Remove any user. You may create one user account for a group of people and give that group the password to the account (example: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

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

To manage a user account:

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. 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.

5. 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 45) 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 52).

11. [Finished] Click the OK button  to accept changes and exit.

EXPORTING USER ACCOUNTS

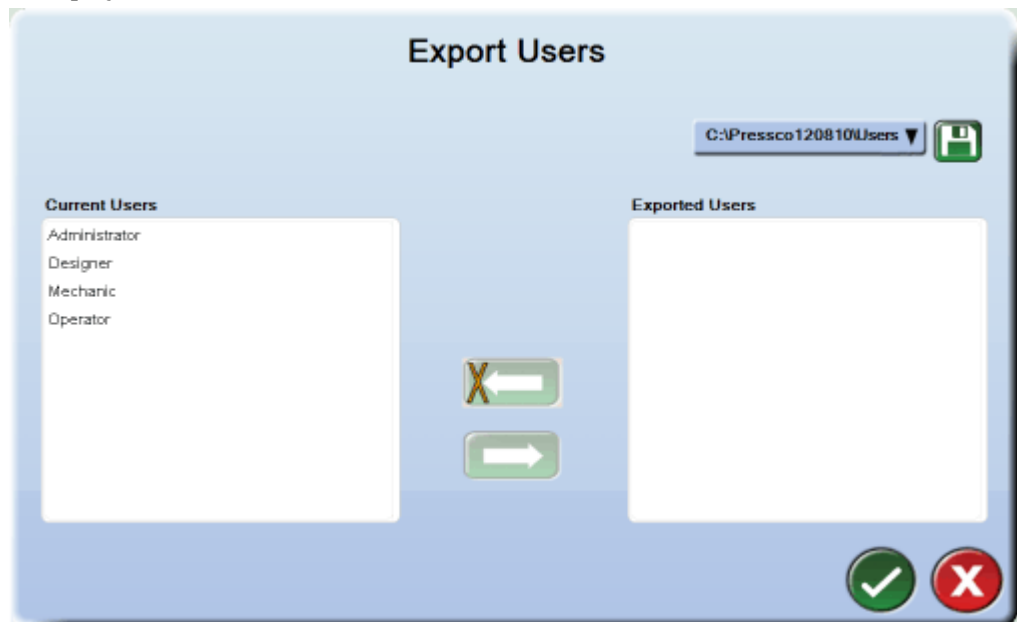
This allows you to export user accounts from one system to another. The user accounts may be used in other Intellispec Series V systems in your plant. You may also want to back up your user accounts in the event they are changed in the system.

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 257) 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 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

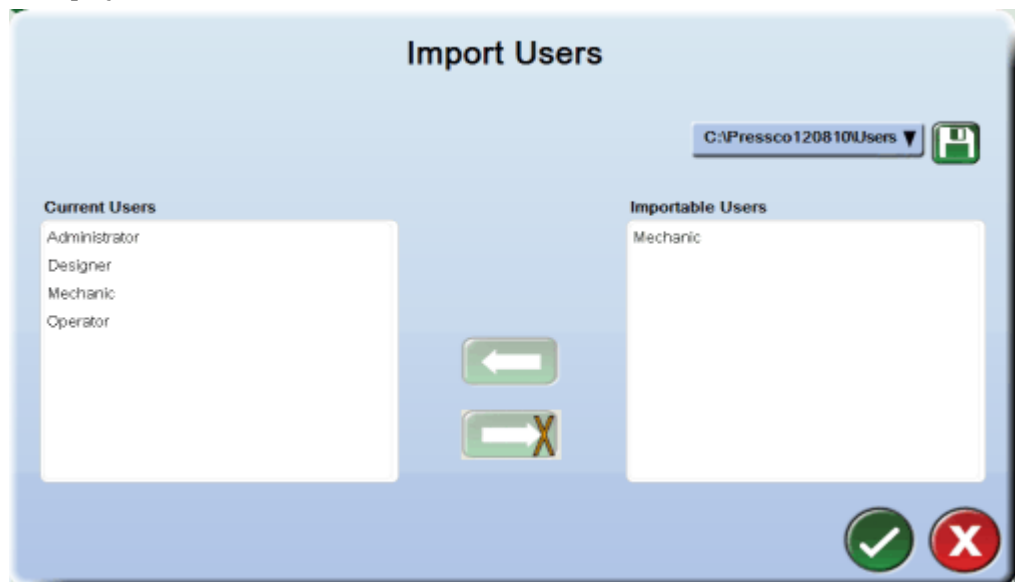
This allows you to import user accounts from one system to another. The user accounts may be used from other Intellispec Series V systems in your plant.

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 257) 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.



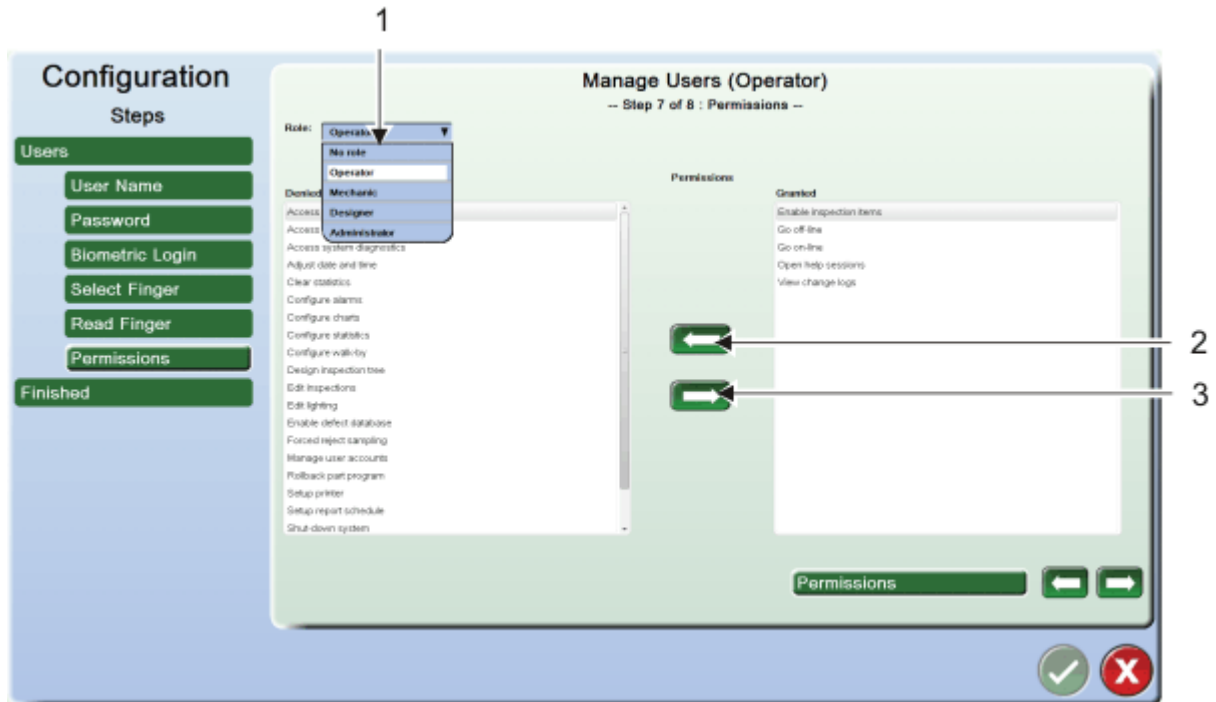
5. Select the user account that you want to Import from the right column. If you do not see any users available, click the Save button  to browse to a location where the user account is saved.

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	Choose one of the Denied Permissions to be granted. 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.

Standard Role Setups	Default Permissions
Not logged in	Access Image Tools Clear statistics
Operator	Forced reject sampling Online Offline Open help sessions Run Mass Recorder Switch part program View system logs

Standard Role Setups	Default Permissions
Mechanic - all Operator permissions, plus:	Access system configuration Access system diagnostics Configure alarms Configure charts Configure statistics Configure walk-by graphic Edit inspections Edit lighting Enable inspection items Manage part programs Rollback part program Run Mass Manager Setup report schedule Shut down system View change logs
Designer - all Mechanic permissions, plus:	Access advanced inspection parameters Design inspection tree Enable defect database
Administrator - all Designer permissions, plus:	Adjust date and time Install language pack Manage user accounts Setup printer Switch report language
Pressco Technician	All Permissions

The following table provides a brief description of all the available permissions. Note that some permissions may not be available in your list. The options that have been permitted without login are removed from the list. For more information, refer to **Editing Permissions** (on page 56).

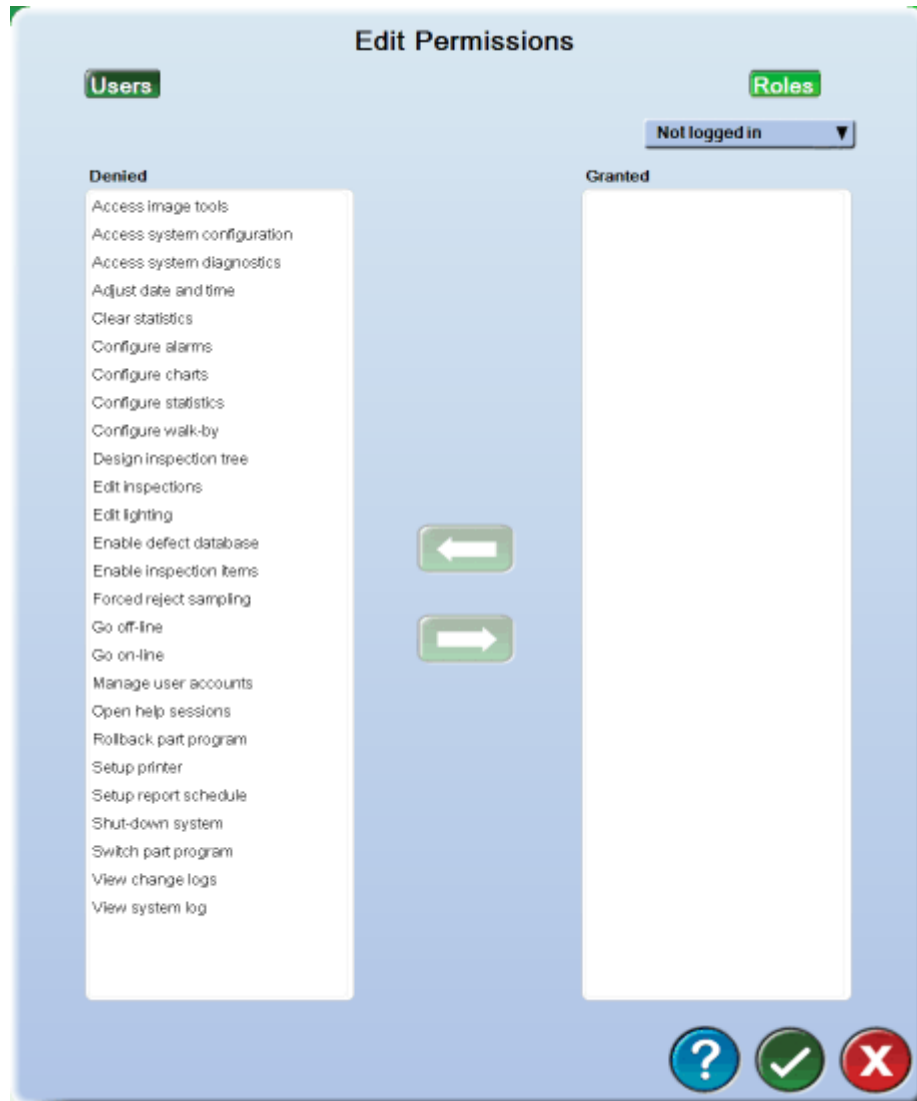
Permission	Description
Access image tools (see " Image Analysis " on page 150)	Gives you access to the Image Analysis Tools.
Clear statistics	Allows you to reset inspection statistics.
Operator	
Forced Reject (on page 120) Sampling	Allows you to request forced reject sampling.
Online (see " Online / Offline " on page 24)	Allows you to put a lane online.
Offline (see " Online / Offline " on page 24)	Allows you to put a lane offline.
Open help sessions (see " Help - Remote Support " on page 141)	Allows you to start a remote help session with Pressco Technical Support.
Run Mass Recorder	Used with mass sensors, this allows you to enter sample data from cut and weighed bottles.
Switch part program	Allows you to change the part program that the system is currently

Permission	Description
	running. This also allows you to add a new part program.
View system logs (see " Log Reader " on page 106)	Allows you to view the system logs.
Mechanic	
Access system configuration	Allows you to change system configuration values.
Access system diagnostics	Allows you to perform system functions including I/O and correlation diagnostics.
Configure alarms	Allows you to configure the lane and sensor alarms.
Configure charts	Allows you to configure trend charts and other statistics charts.
Configure walk-by (see " Walk By Setup " on page 60)	Allows you to 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.
Edit inspections	Allows you to edit existing inspections.
Edit Lighting (see " Sensor menu " on page 147)	Allows you to change the lighting settings for each camera.
Enable inspection items (see " Inspection menu " on page 185)	Allows you to enable or disable individual inspections and the rejecter for those individual inspections.
Manage part programs (see " How to Create, Copy, or Import a Part Program " on page 182)	Allows you to create, import, export, copy, or load part programs.
Rollback part program (see " Part Program Change Log " on page 188)	Allows you to roll the current part program back to a previous state.
Run Mass Manager	Used with mass sensors, this allows you to select appropriate Scaling Recorder sessions to scale the Intellispec readings.
Setup report schedule (see " Schedule Reports " on page 104)	Allows you to schedule statistics reports to be generated periodically.
Shut down system (see " Exiting the Intellispec software " on page 44)	Allows you to shut down the Intellispec system.
View change logs (see " Part Program Change Log " on page 188)	Allows you to view the inspection change logs.
Designer	
Access advanced inspection parameters	Allows you to access advanced parameters inside of the inspections, and access some inspection tree items (such as regions).
Configure statistics (see " Statistics Grid Configuration " on page 79)	Allows you to configure how the statistics graphs are displayed.
Design inspection tree	Allows you to add or delete inspections.
Enable defect database	Not available as of this printing.

Permission	Description
Administrator	
Adjust date and time (see " Adjusting Date and Time " on page 137)	Allows you to adjust Intellispec system date and time.
Install language pack (see " Language " on page 41)	Allows you to update the language files for the user interface, if provided by Pressco.
Manage user accounts (see " Managing user accounts " on page 47)	Allows you to open Manage Users which lets you add, edit and remove users.
Setup printer (see " Setting up a printer " on page 138)	Allows you to configure a printer for Intellispec reports.
Switch report language (see " Language " on page 41)	Allows you to choose a language for the Intellispec reports.

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:

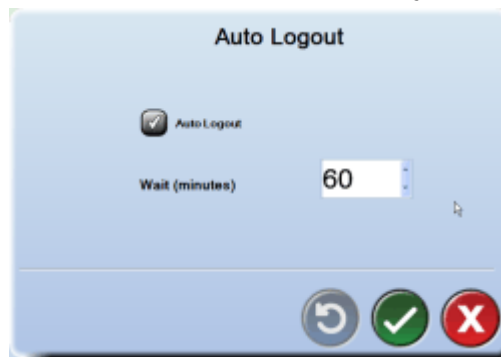
1. Log in as Administrator.
2. Click the Log in button with your name on it to see the Log in menu.
3. Select Manage Permissions. The Edit Permissions screen is displayed.
4. Select a user from the User drop-down menu.
 - Move the desired permissions between Denied and Granted. Or:
 - Assign that user 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 log you out 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 6

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



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 60).

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.



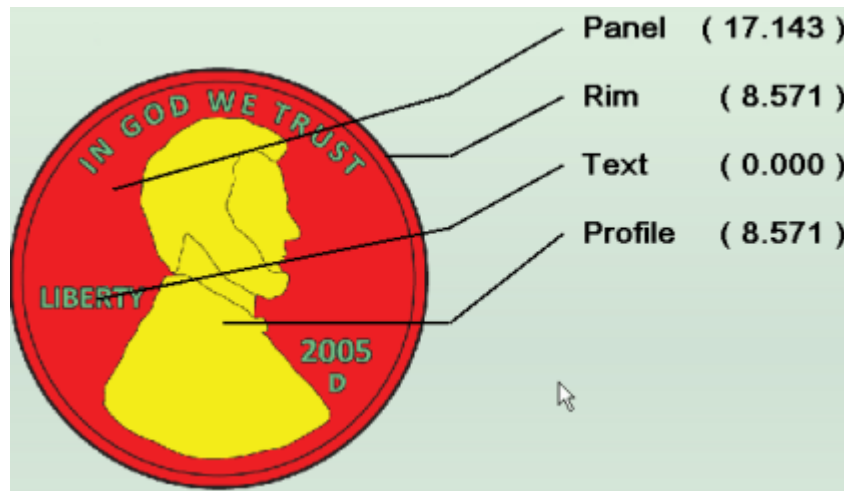
2. Click the More Lane Information bar in the center of the screen to display more graph options.



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.



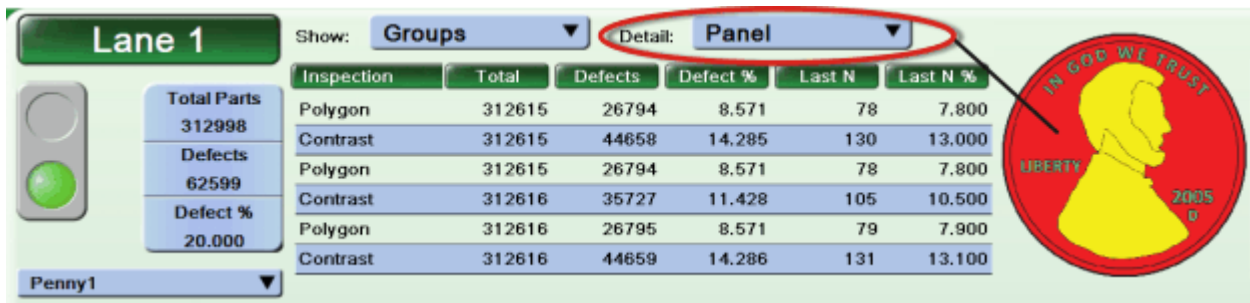
The large Walk By Graphic displays the group names, pointing to the appropriate areas on the part. It also displays the current defect percentage for each of those groups, from inspection results.



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 60)



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.



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.
2. 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. 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.

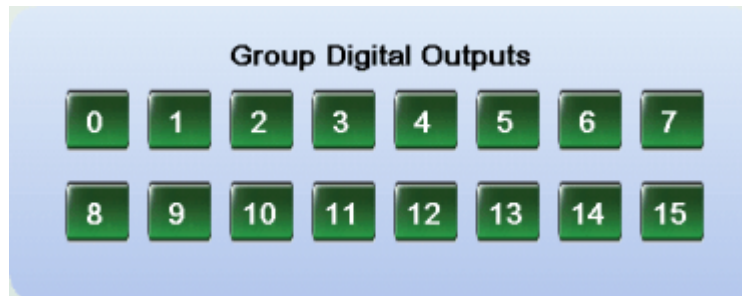
Failure Percent

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 294).



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, even groups from other lanes.

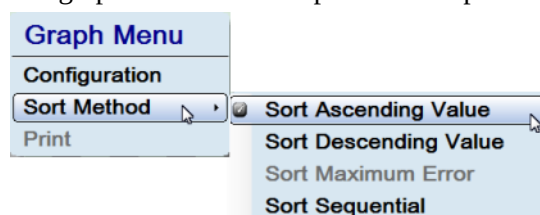
SORTING DATA IN GRAPHS

You can change the order of the displayed data in the **Machine Part Graphs** (on page 73).

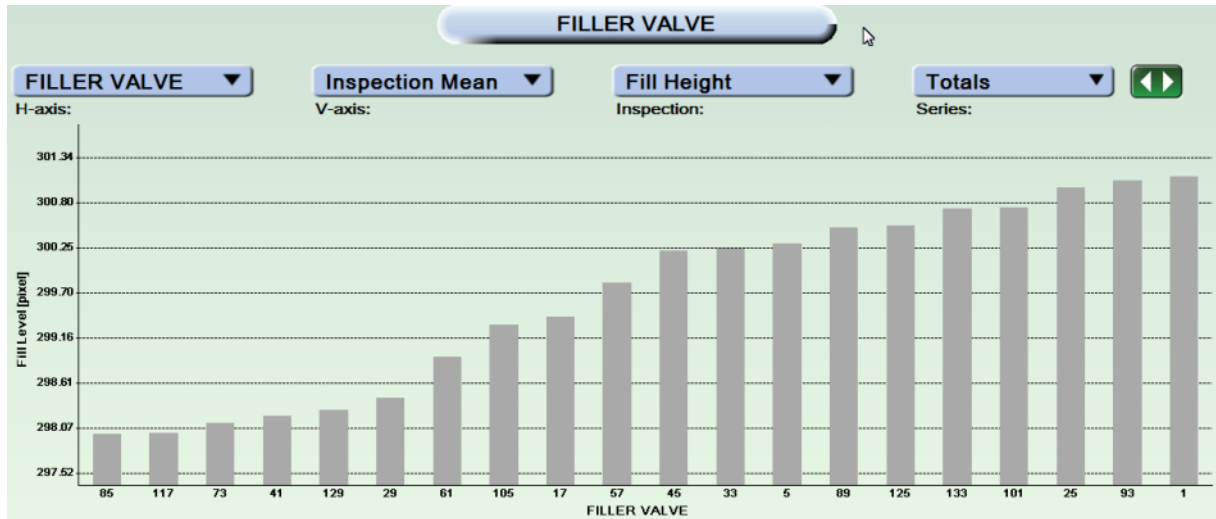
❖ *Note: when you change sorting order, it affects the **Machine Part Graphs** in the upper and lower screens. Other graphs are not affected.*

To sort the graph data:

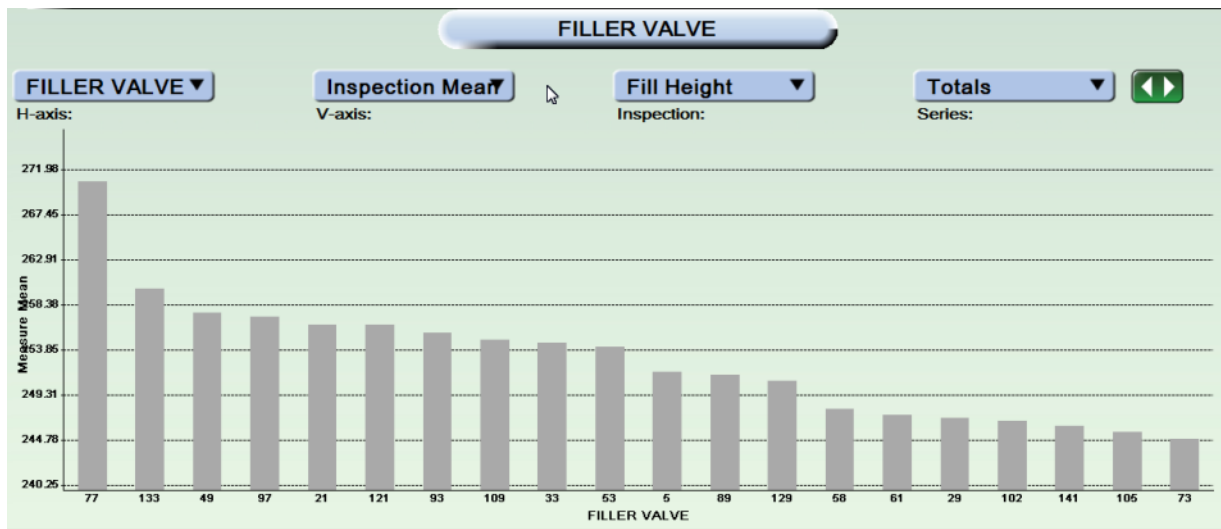
1. Right-click over a Machine Part Graph. The Graph Menu is displayed.
2. From the Graph Menu, select Sort Method, and select an option. The data on the graph is sorted. The options are explained below.



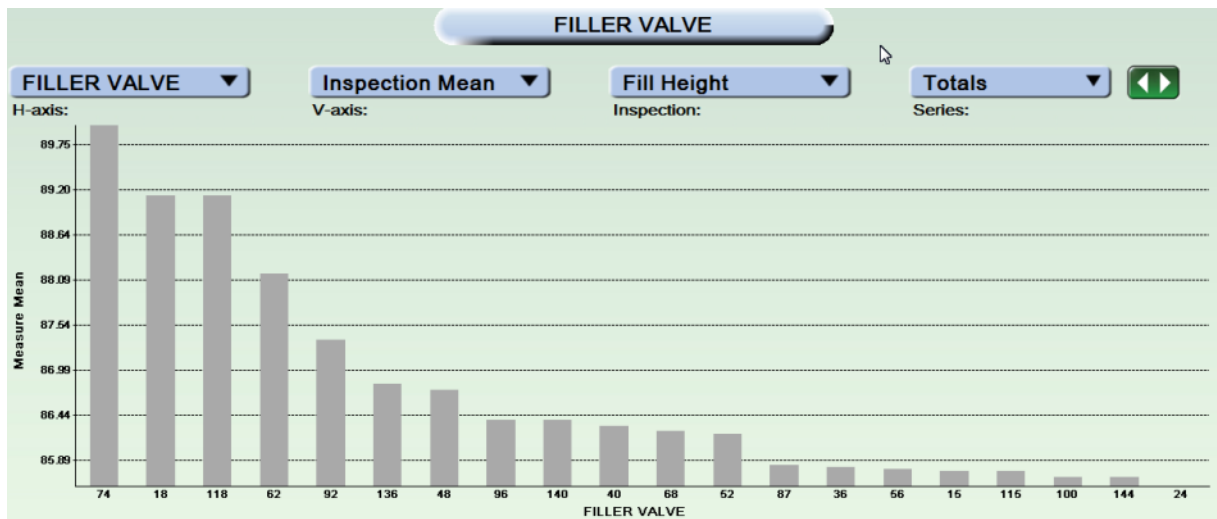
- **Sort Ascending Value** – Sort from low to high result. In the example below, the machine part with the most amount of defects is shown on the right side of the graph.



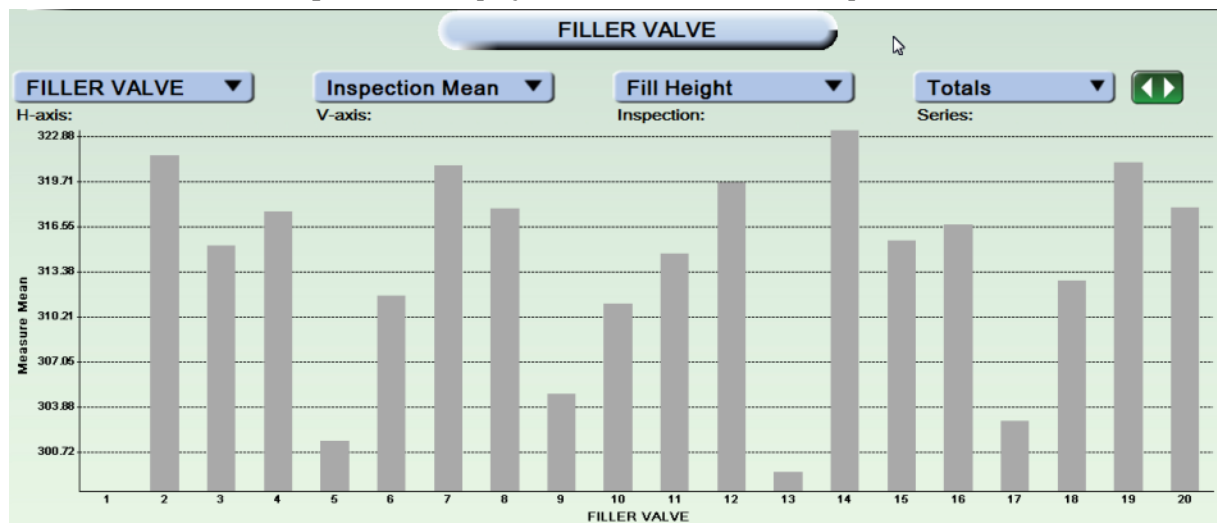
- **Sort Descending Value** – Sort from high to low result. In the example below, the machine part with the most amount of defects is shown on the left side of the graph.



- **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.



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.

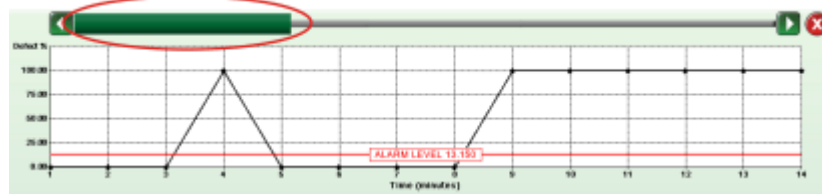
- In a time-based graph, if the graph time per update is set to one minute, then the data goes back 48 hours
- In a part-based graph, if parts per update is set at 1000 parts, then the data goes back 2,880,000 parts

See **Trend Chart Configuration - System Overview** (on page 67) or **Trend Chart Configuration - Lane Overview** (on page 68) 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

When there are more machine parts than can be plotted on the graph, a scroll button

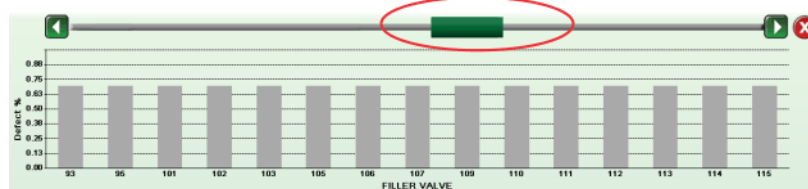


becomes available to view other filler machine parts.

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.

PRINTING DATA IN GRAPHS

This feature is currently unavailable.

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.

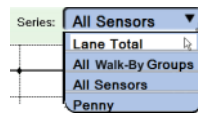
*These items are available for Trend Graphs (only in the upper screen) if:

- 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

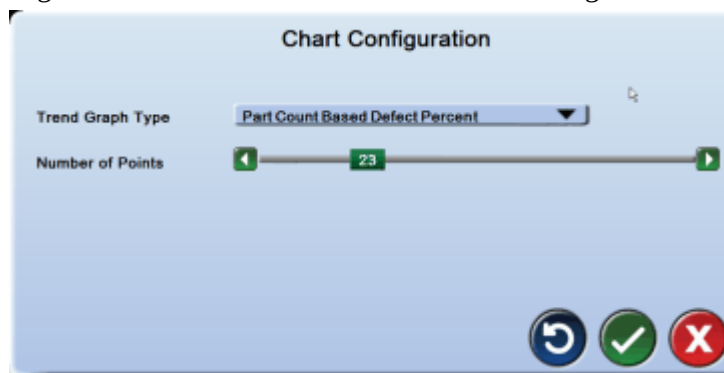
This is the setting for the trend chart displayed on System Overview screen.

❖ *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*

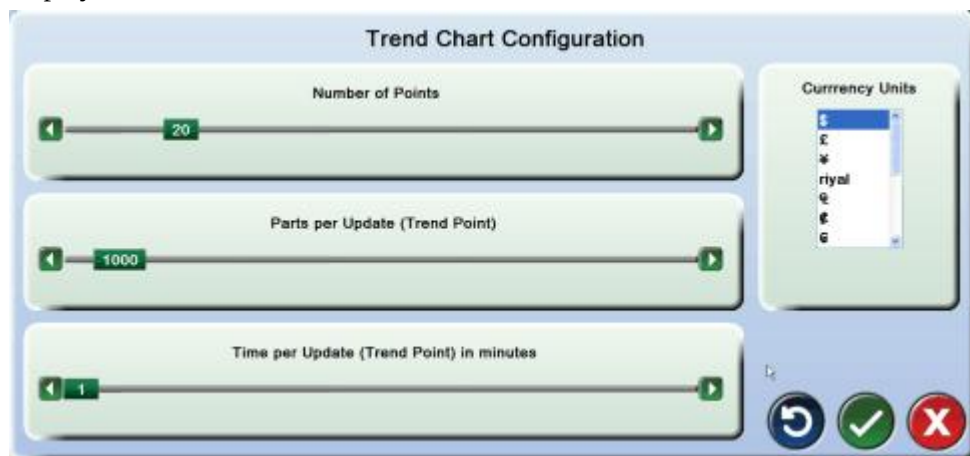
Trend Chart Configuration - Lane Overview

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.

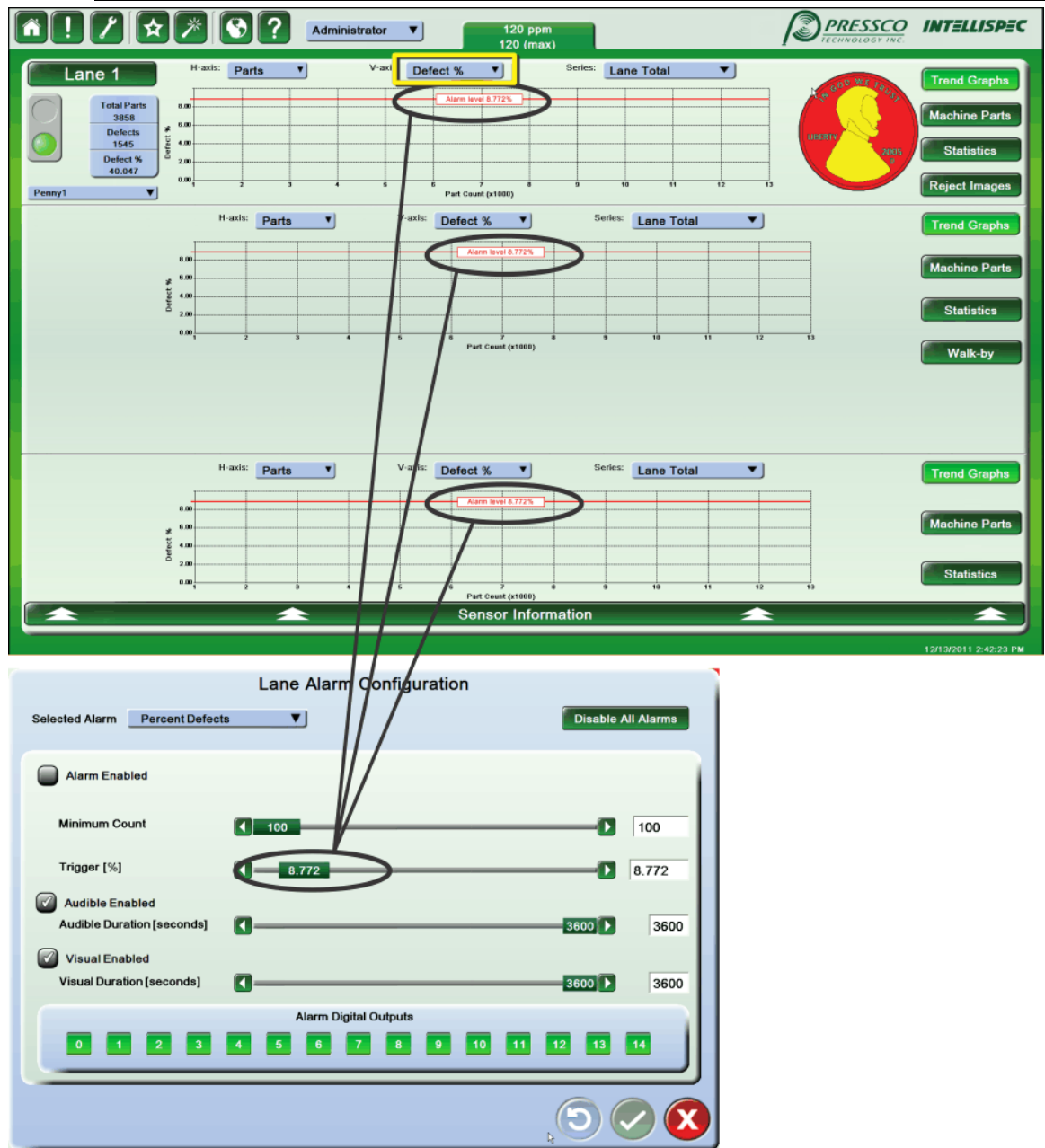


5. Select the desired settings from all the available parameters.
6. Click the OK button to save your changes and exit the screen. All the trend charts for the selected lane are updated to reflect your changes.

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 91) 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.



REJECT IMAGES

Reject Images

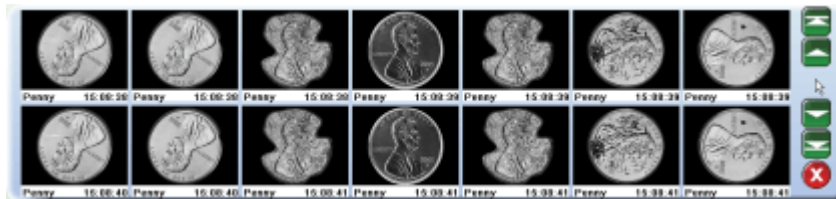
Reject Images are images from the last 100 defects from a sensor (or all sensors for Lane Overview mode). These images are available in the Lane Overview screen and the Sensor Overview screen.

To view Reject Images:

1. From the System Overview screen, click a Lane n button to display lane information.
 2. 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:

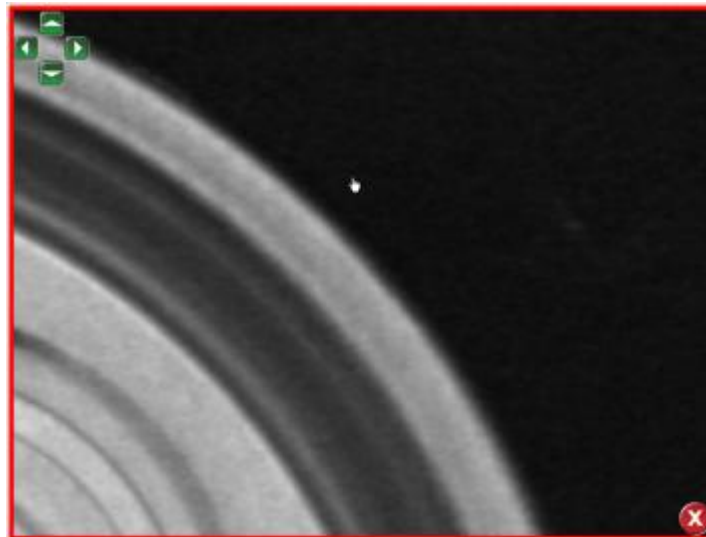
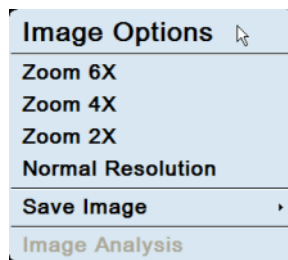
- Click an image from the Lane Reject images to display the corresponding Sensor information in the lower part of the screen.

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. Click in the magnified area to toggle the magnifier.



- Right-click on the image to choose a zoom amount. An enlarged image, the same size as the **Big Live Image** (on page 84) is displayed. Use the navigation arrows, or click and drag the cursor to pan around the image.
- From the pop-up menu, you may also choose **Image Analysis** (on page 150) (when the lane is offline).
- Click the exit button  to close the zoom window



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.

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
Contrast	Bad
Polygon	Bad
Ambient	Bad

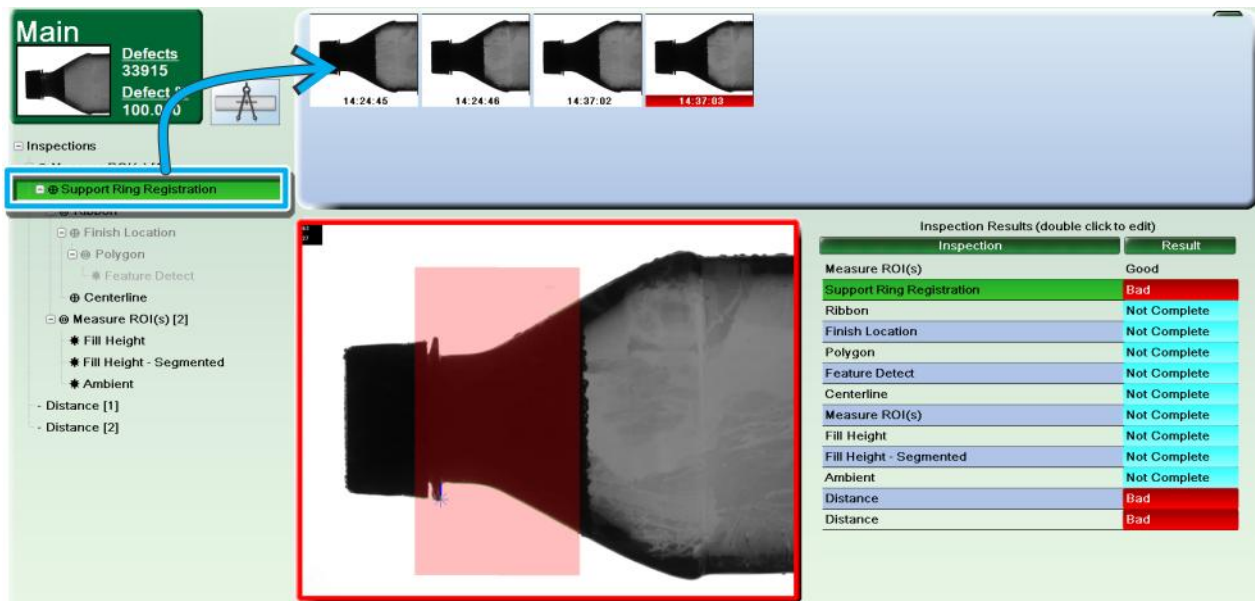
- Click an inspection in the list to the right of the large image. This will show defect graphics for the specific inspection, such as the region and any diagnostics that are associated with that inspection.

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
Fill Height	Bad
Fill Height - Segmented	Bad
Ambient	Good
Distance	Bad
Distance	Bad

- 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** (on page 234) inspection editor opens. For more information about the inspection editor, see **Inspection Editor** (on page 196).

❖ *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 (if any). This is useful if you want to know what types of defects are being caught by that inspection.



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.

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

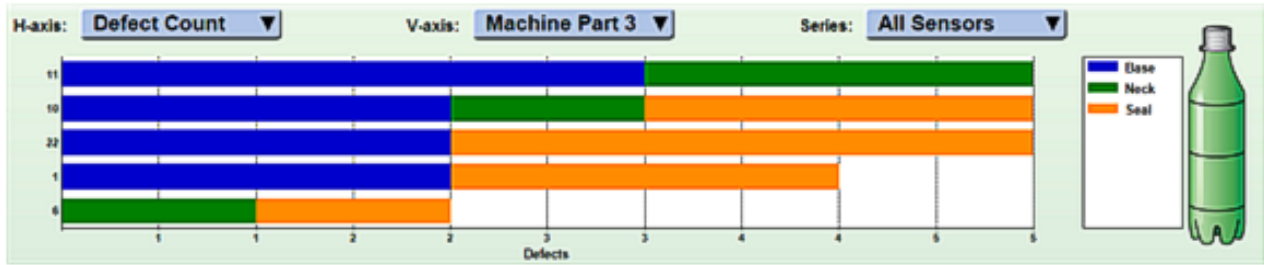
H-axis	V-axis	Inspection*	Series
Machine Part (depending on correlation configuration)	- Defect % - Defect Count - Inspection Mean* - Inspection STD* - Inspection CPK*	Inspection name (the names of the inspections that have Retro-Spec statistics enabled)	In the upper screen: - Lane Total - All Sensors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

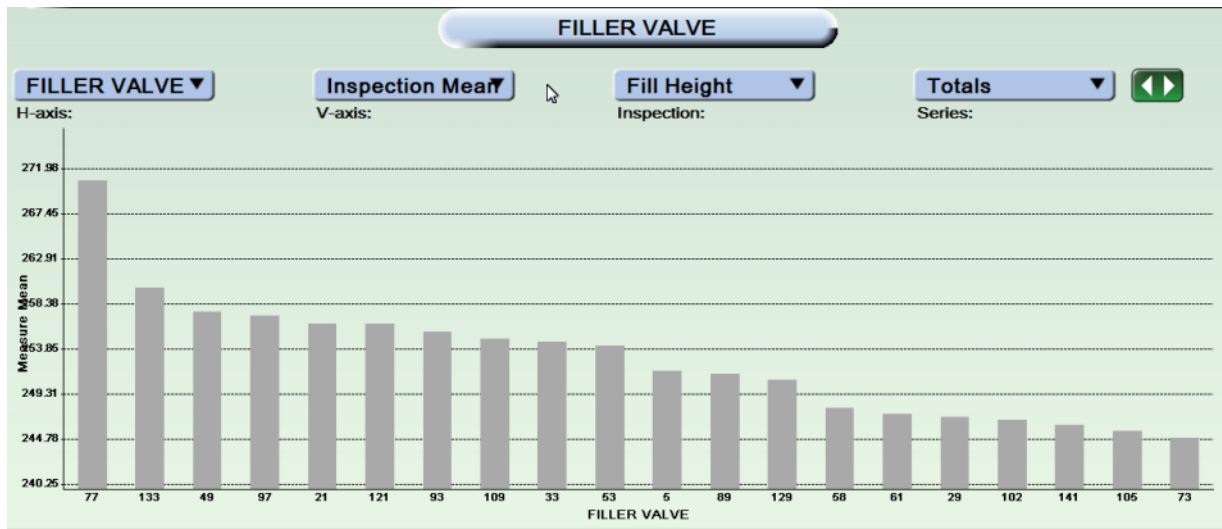
An example graph is displayed below. It shows defects for a machine part type, and the number of defects correlated to each sensor.



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** (on page 62).



Retro-Spec Statistics

Inspections that collect measurement data have the ability to collect Retro-Spec statistics. These inspections have a check box called "Keep Retro-Spec Statistics." This feature must be enabled in order for the system to keep this data. The inspections include:

- Ambient
- **Fill Height** (on page 234)
- **Fill Height - Segmented** (on page 242)
- Label Skew Extract
- **Distance** (on page 250)
- Angle

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** (on page 234) inspection menu.

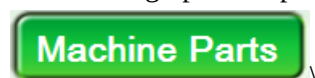
Empty / Full	Calibration
Measure ROI(s)	Fill Height Reference Fill Top Fill Botto
Fill Mode	Top and Bottom
Part Orientation	Closure on Left
Reference Region	Region 1
Fill Ratio	53
Correct Fill Position	☒ Enabled
Fill Correction Deviation	59.0@
☒ Fill Height Limits	50.0@ +405.92@/ -40.0@
Show Fill Height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

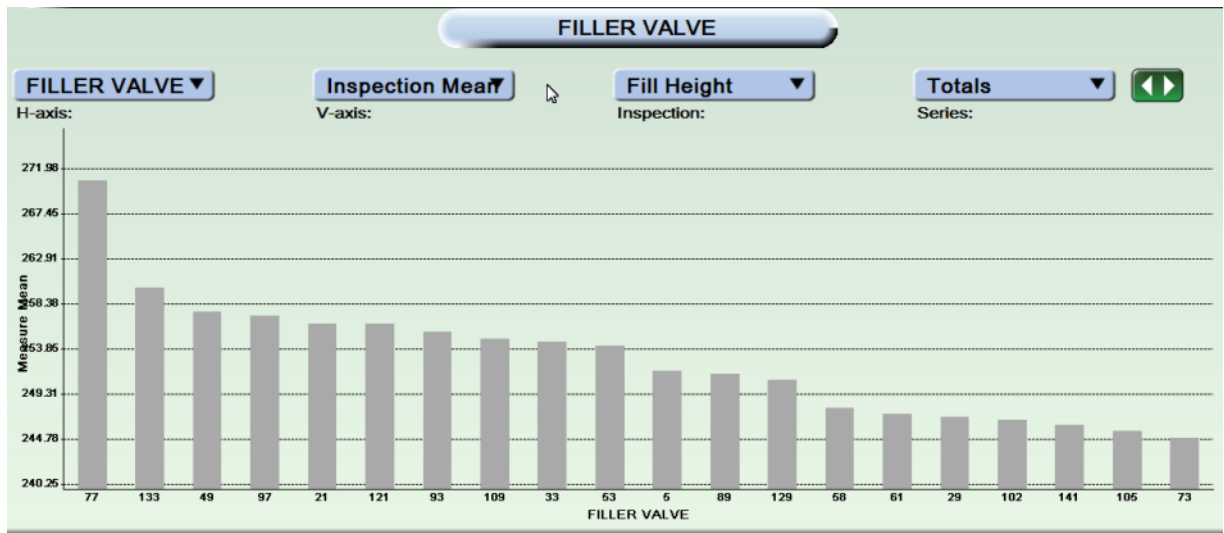
In either the **Lane Overview Screen** (on page 37) or **Sensor Overview Screen** (on page 39), click the **Machine Parts** button on the right side of the screen. A machine parts correlation graph is displayed.



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.

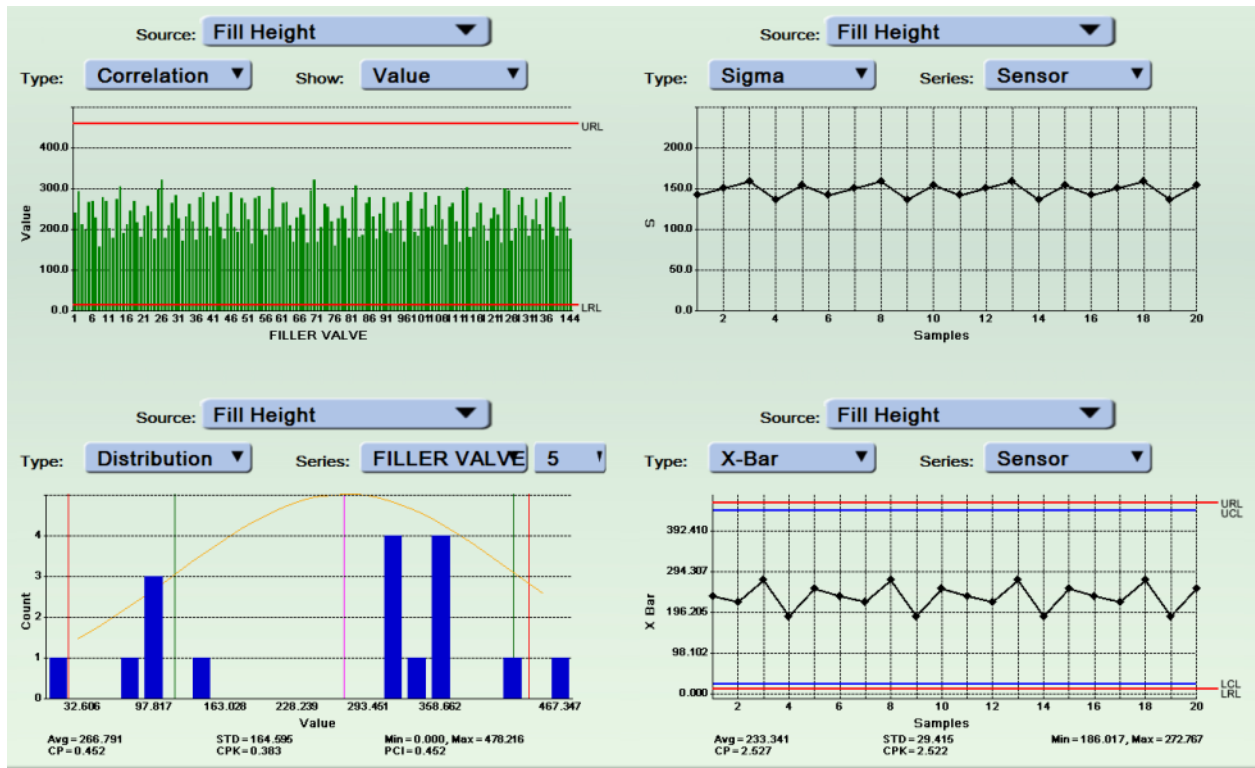
- ❖ *Note: to choose an inspection to view (in this example: "Fill Height"), you must select Inspection Mean, Inspection STD, or Inspection CPK in the **V-axis** drop-down menu. In addition, you must select "Lane Total" in the upper screen or "Totals" in the lower screen from the **Series** drop-down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

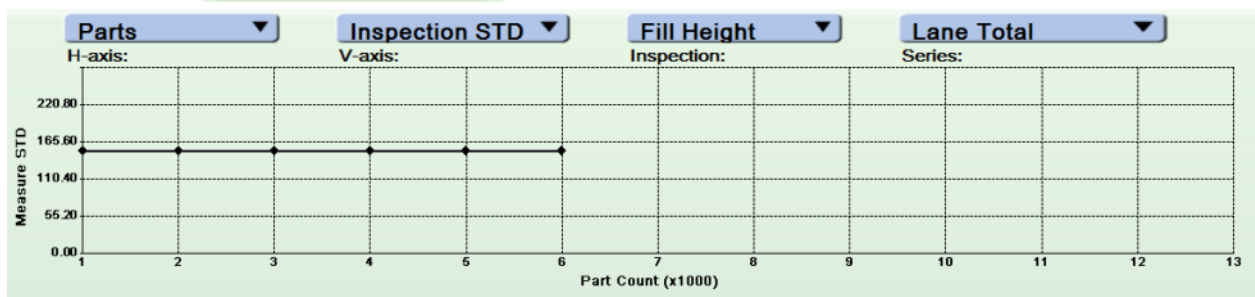
In addition to displaying fill height data in the Machine Parts graphs, you can plot the fill level in the **SPC graphs** (see "**Statistical Process Control (SPC) Charting**" on page 82) to show the data for the inspection in several different ways.

SPC Graphs



Another way to view fill height data is through the **Trend Graphs** (on page 66) in the upper screen.

Trend Graphs



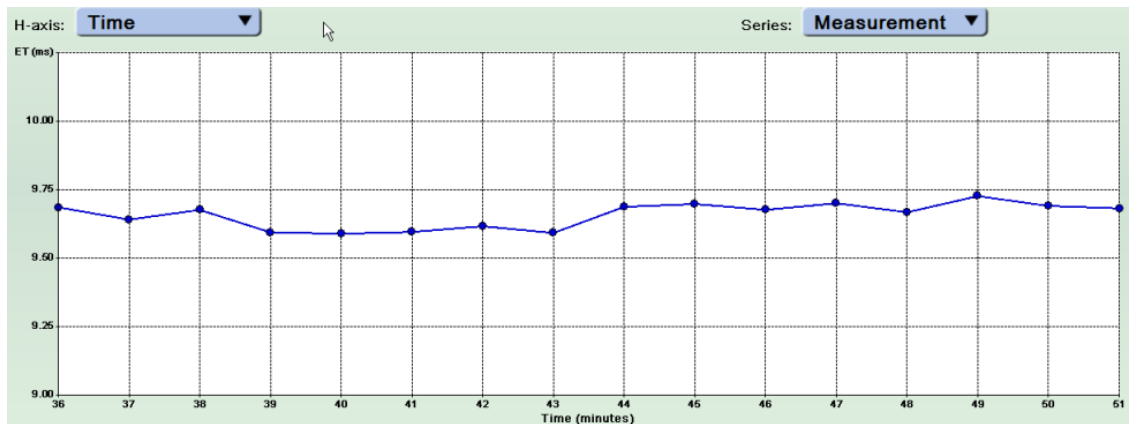
TIMING TREND

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.

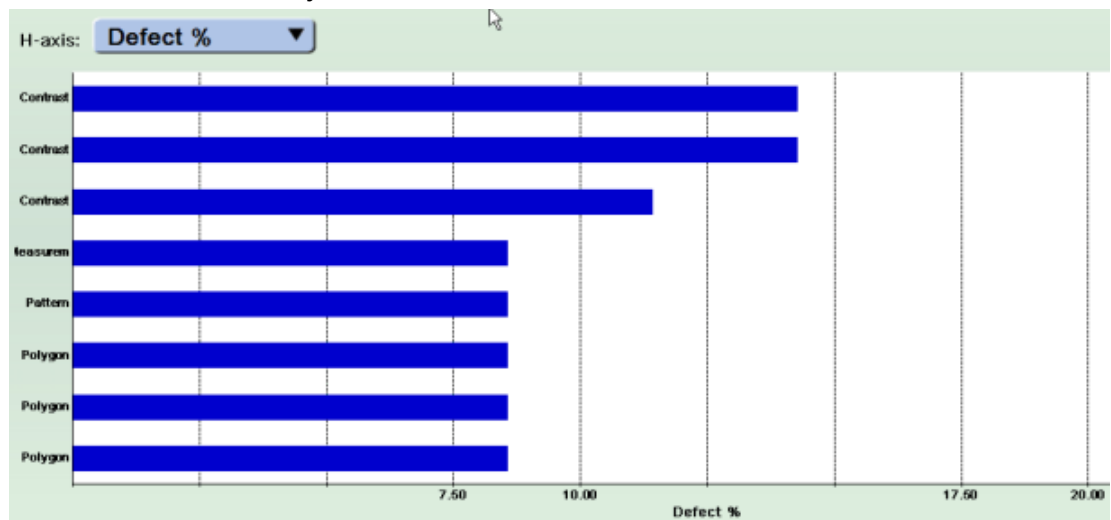
The choices for the Series in the Timing Trend chart allow you to choose Sensor Total, which is all inspections for that sensor, or any individual inspection for that sensor.



INSPECTIONS GRAPH

Inspections

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

Statistics

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 81) 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

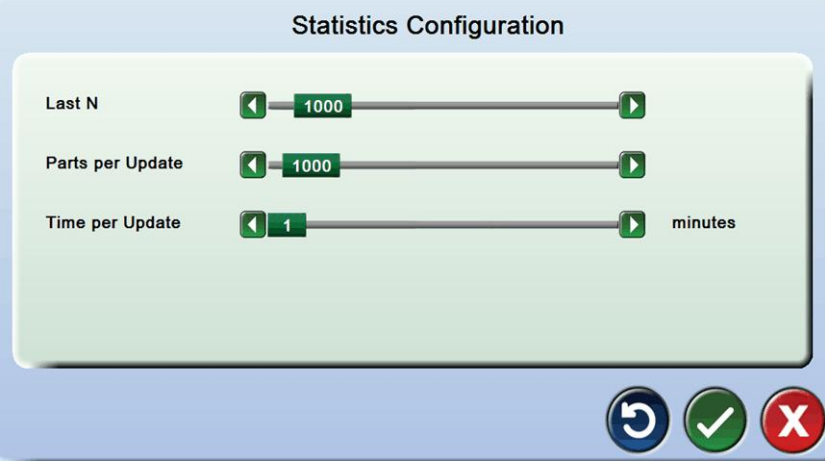
Statistics Grid Configuration

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 value of '1000'. The second slider is labeled 'Parts per Update' and also has a value of '1000'. The third slider is labeled 'Time per Update' and has a value of '1', with the unit 'minutes' to its right. 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

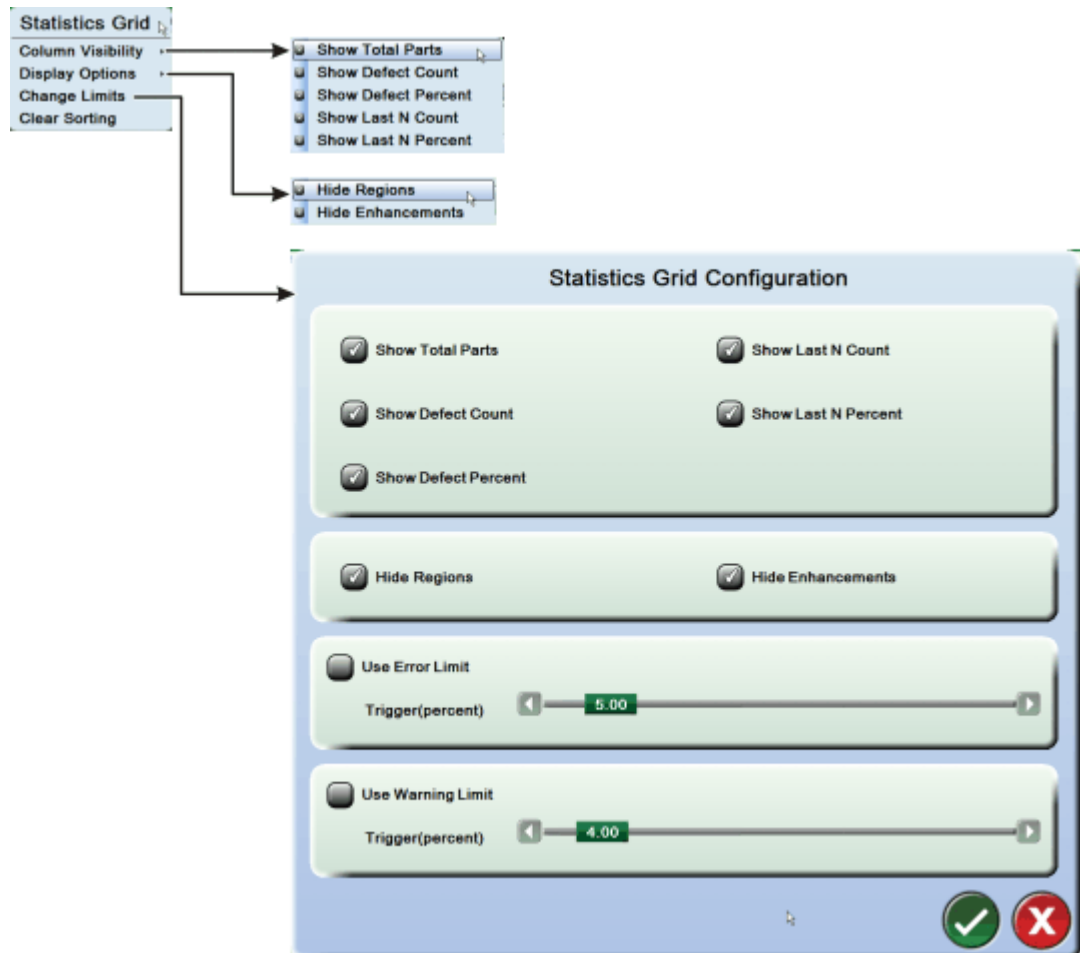
Determines the graduations on the horizontal axis for the Trend Chart and Timing Trend if "Parts" is selected.

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

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.

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

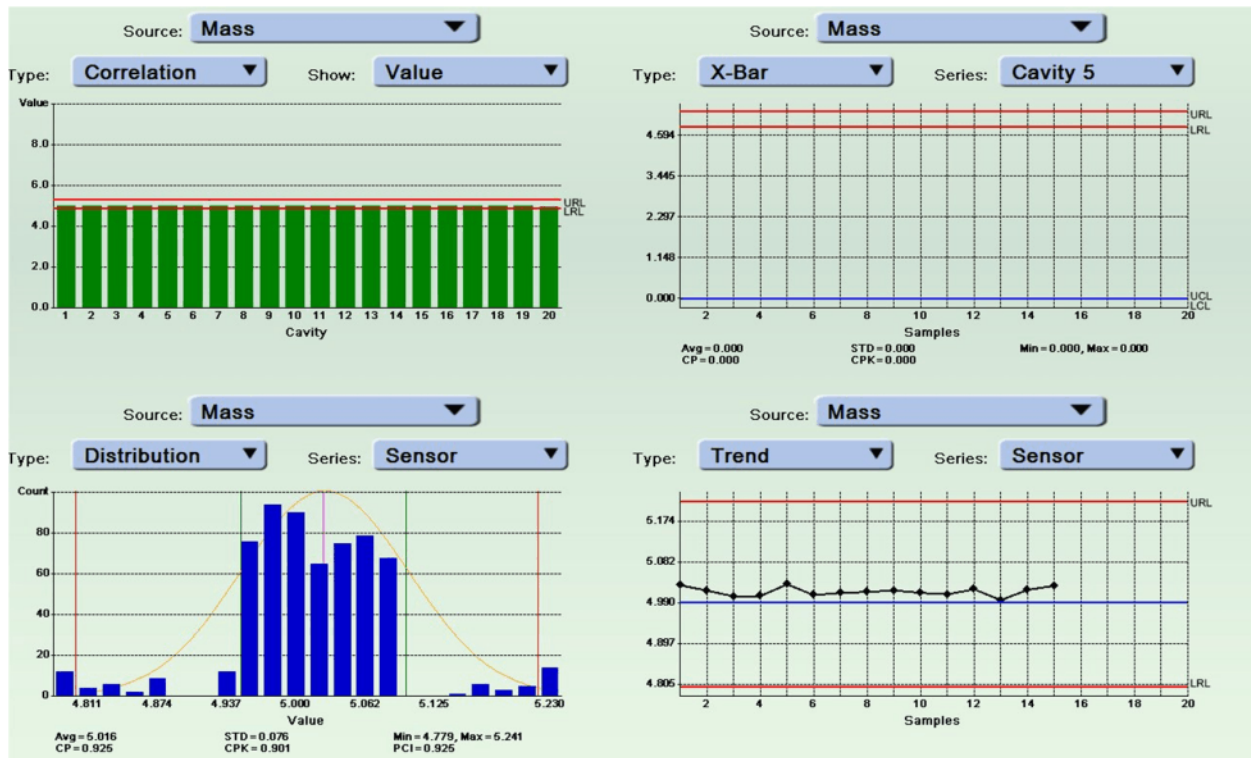
Series/ Show

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.

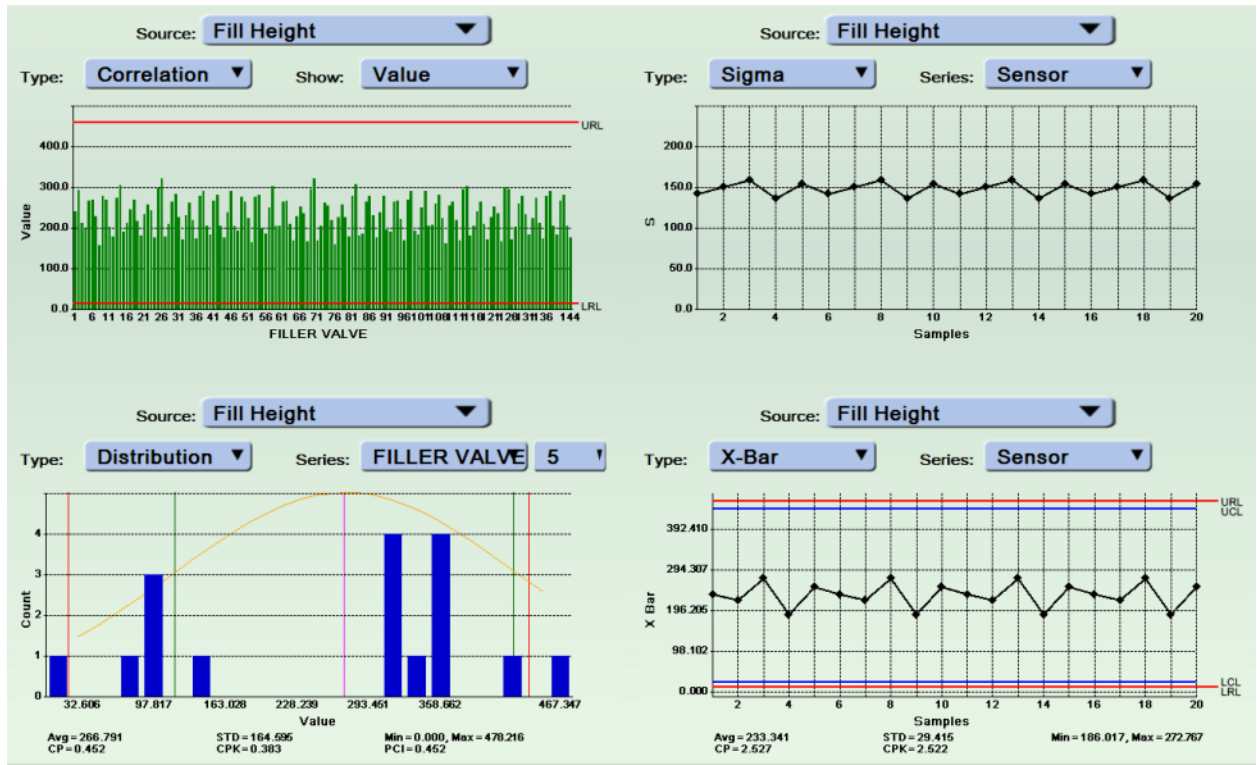
When the Correlation chart is selected, the **Show** category allows the selection of:

- **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.



BIG LIVE IMAGE

Big Live Image

Click the Big Live Image button in Sensor Overview mode to view an enlarged image of the last part that was inspected.

This image is updated when the lane is online and the camera is snapping images. The image is outlined in green if the part is passing, yellow if it is in a warning state, or red if the part is failing. You can view this image from a distance to quickly see how the inspection process is performing.



Chapter 7

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 43) 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 106), even when the alarms are automatically cleared.*

Alarm Name	Cause	Reset Mechanism	Color in light tree
System Alarms (see "System Alarms Description" on page 90)			
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 93)			
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 98)			
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 293) 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:

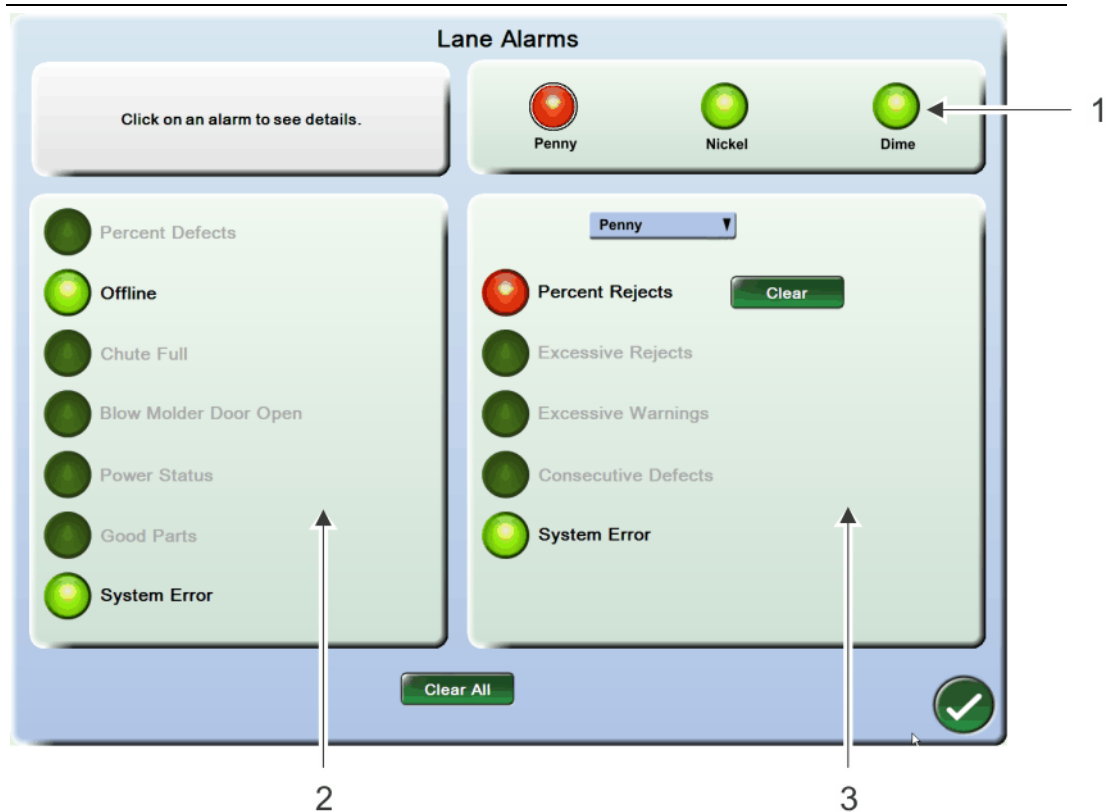
Click an LED in the View/Clear Alarms screen.



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:

- Click the Home button  to view the System Overview screen.
- 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 93).

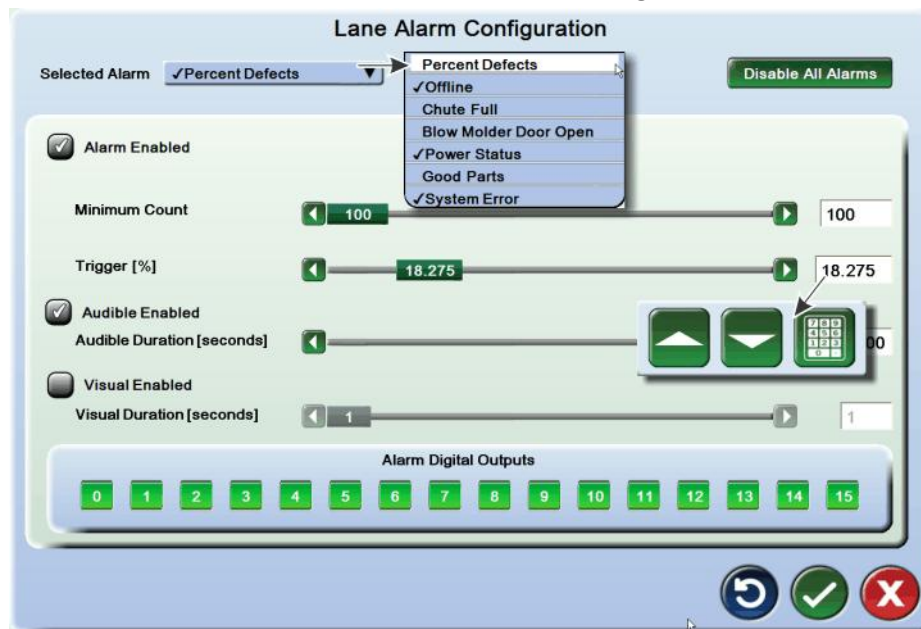
❖ *Note: Some menu items are only available to advanced level users.*

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.
4. 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 68) 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 0-15**) to be toggled on the optional **Extended I/O** (see "**Extended I/O board**" on page 294) kit when the alarm is triggered.

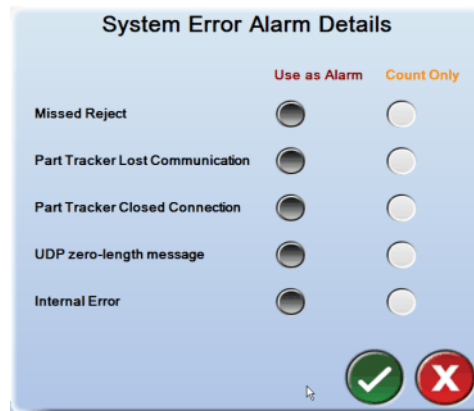
- There are 16 available **Inspection Alarm** outputs that correspond to the **extended I/O signals** (on page 295). Click one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared.
- The outputs 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

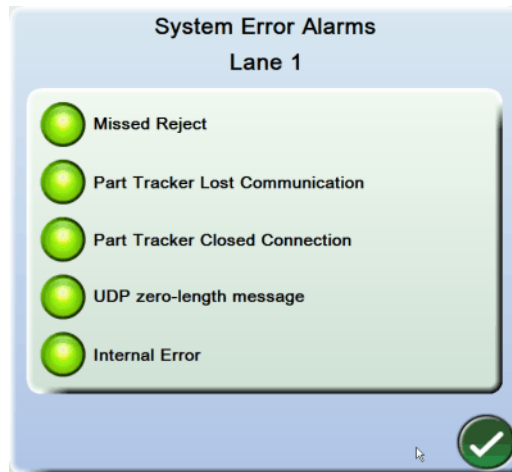
This alarm can be used as a part counter. For example, say you are inspecting preforms, and have a box at the end of the conveyor (after inspection) that holds 5000 preforms. This alarm will count the number of good inspected parts, and notify you when 5000 good parts have reached that box. The Alarm 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 294) 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 91) to see how this alarm is configured.



These errors are recorded in the **Log Reader** (on page 106). 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**" on page 134). 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 118) are enabled and two **Reject Confirm rejectors** (see "**Reject Confirm Calibration**" on page 134) are enabled.
- **Part Tracker Lost Communication** - You may be able to reset the Part Tracker to re-establish communication. **Resetting the Part Tracker Board in FHCP 3X** (on page 303)
- **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 98).

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

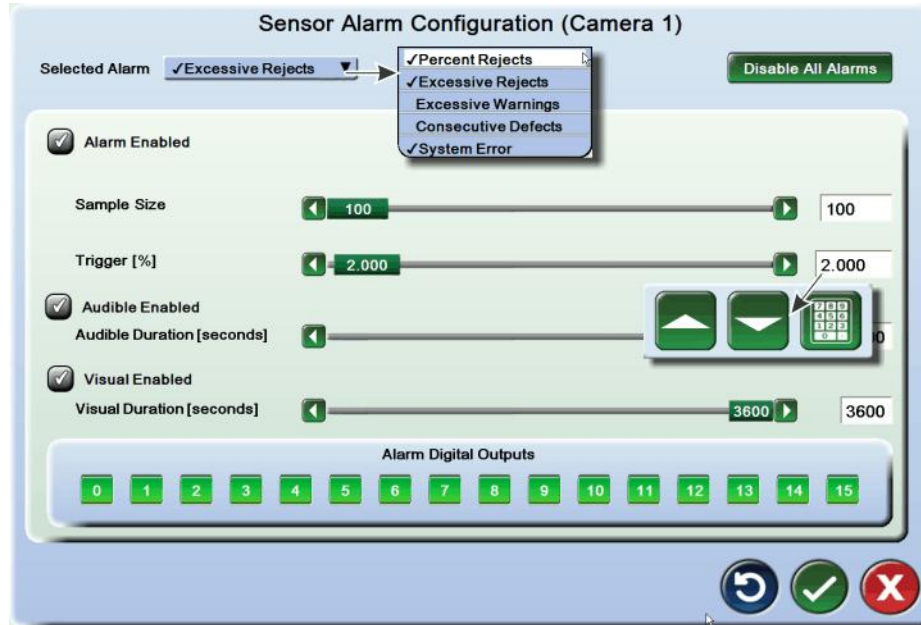
To get to this menu:

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.

5. 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 68) 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 0-15**) to be toggled on the optional **Extended I/O** (see "**Extended I/O board**" on page 294) kit when the alarm is triggered.

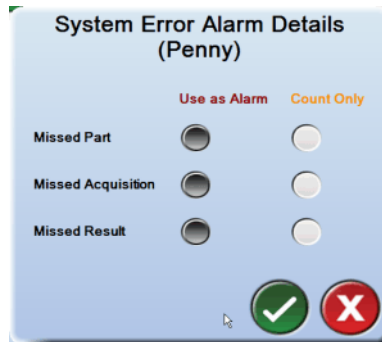
- There are 16 available **Inspection Alarm** outputs that correspond to the **extended I/O signals** (on page 295). Click one of the output numbers to assign the current alarm to an output.
- These outputs go active when the alarm is triggered, and go inactive when the alarm is cleared.
- The outputs 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 95).*

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.

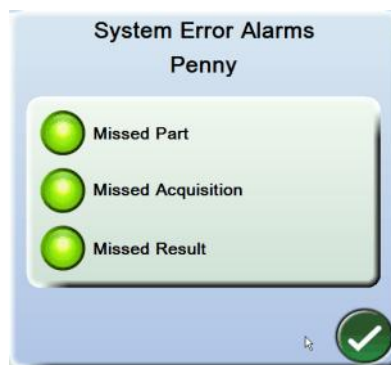
Warnings are enabled in the **Retro-Spec Options** (on page 202) when you are editing an inspection.

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 95) 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 106).

- **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 182).
- **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 182).

Chapter 8

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:

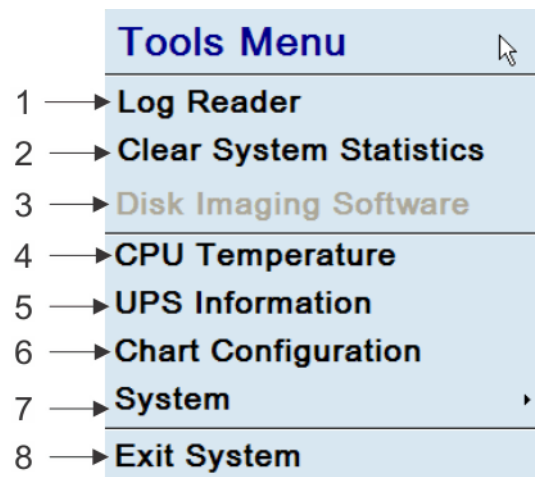
1. Log in. (Some items may be grayed out if you do not have permissions to use the items)



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 106) – 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	System - Set system date and time or set up a printer

TOOLS MENU - LANE OVERVIEW AND SENSOR OVERVIEWS 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.

Tools Menu	
Reporting	▶
Part Setup	▶
Lane Setup	▶
Hardware Setup	▶
Shutdown this Lane	

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 System Configuration button to view the Tools menu.
3. From the Tools menu select Reporting, then select your desired option. These are described below.

Tools Menu	
Reporting	▶
Part Setup	▶
Lane Setup	▶
Hardware Setup	▶
Shutdown this Lane	

Lane Summary Report	◀	1
Lane Detail Report	◀	2
Schedule Reports	◀	3
Log Reader	◀	4
Sensor Missed Statistics	◀	5

1	Lane Summary Report (on page 103) - Generate a summary of the statistics for the current lane.
2	Lane Detail Report (on page 104) - Generate a report with the lane and sensor defect statistics broken down to inspection-by-inspection data.
3	Schedule Reports (on page 104) - Define the frequency and destination for automatic statistics reporting.
4	Log Reader (on page 106) – Open the Intellispec log

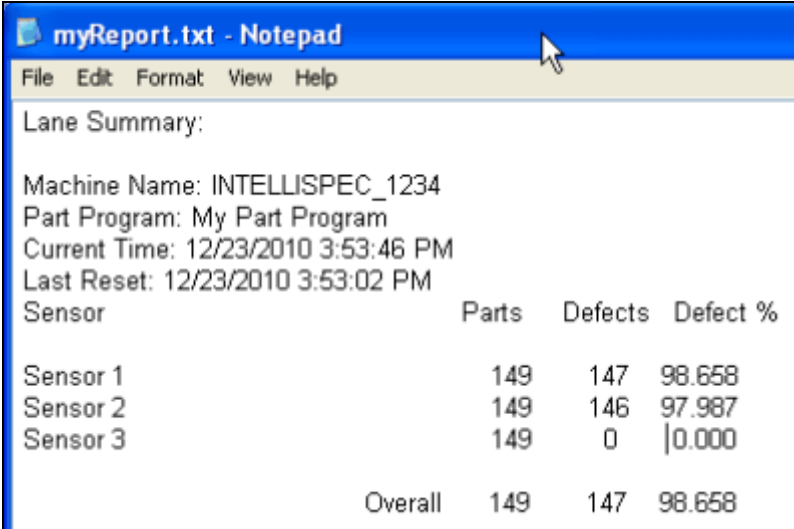
5	Sensor Missed Statistics (on page 107) - Display the number of missed parts for the lane.

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 103), 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

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 Configuration 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 103) and **Lane Detail Report** (on page 104).

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.

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 thereafter.

Log Reader

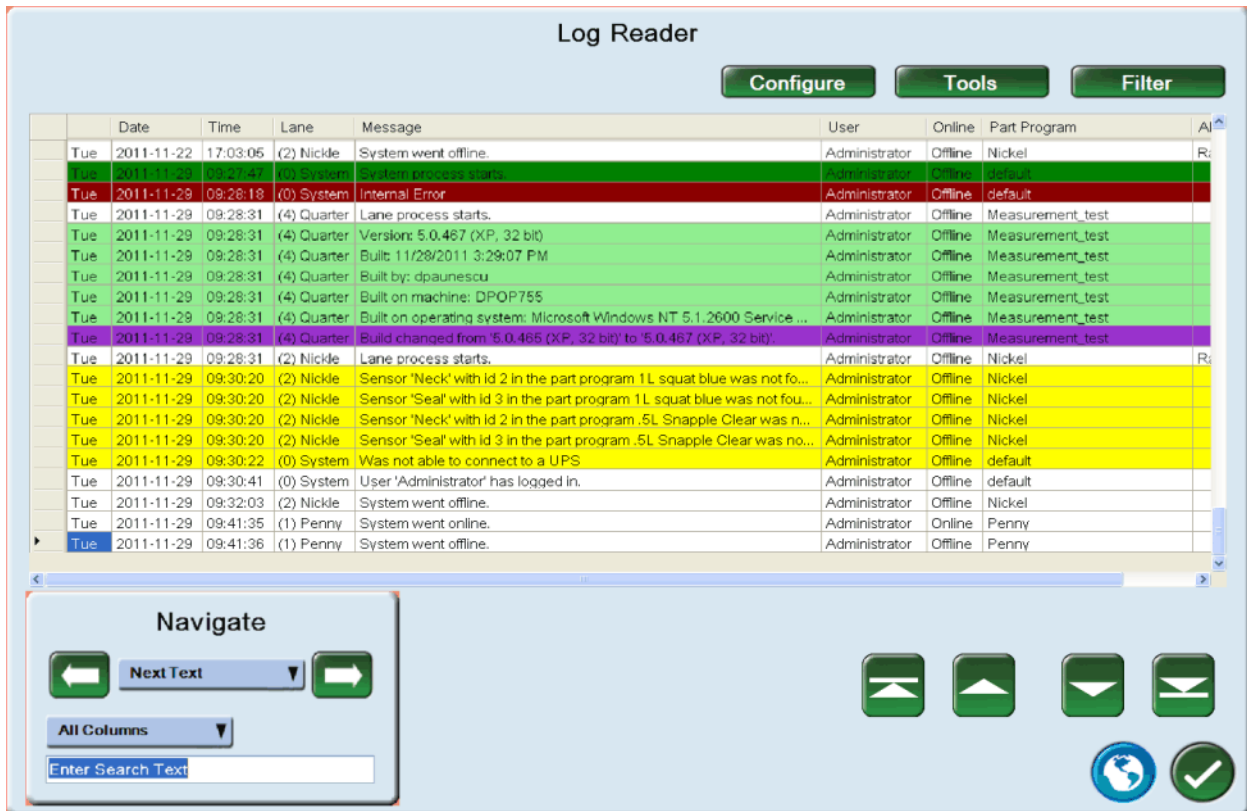
The log reader displays the Intellispec event history including:

- 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 188)*

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

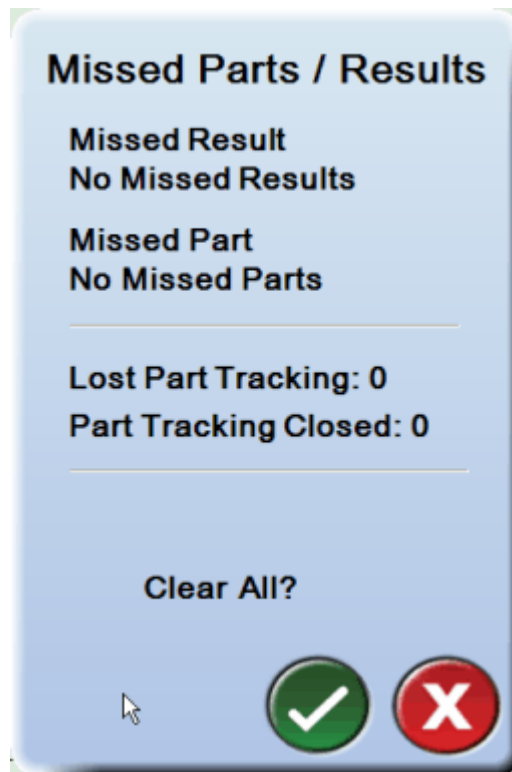
Text files of the logs are stored at: C:\Pressco\Logs.



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

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 106).

Missed Results

This can occur if you set the **Reject Delay Calibration** (on page 128) 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.

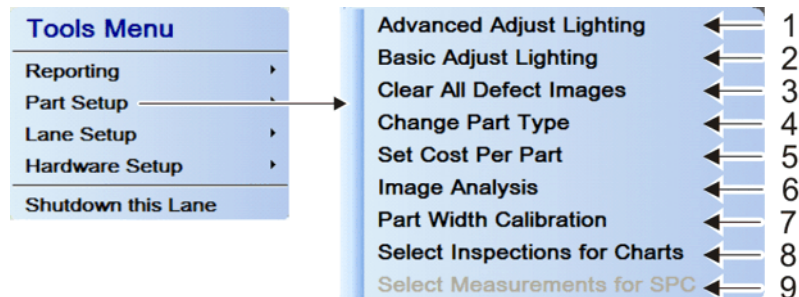
To view the Part Setup menu:

1. View the Lane Overview screen by clicking a Lane n button.



2. Click the System Configuration button to view the Tools menu.
3. From the Tools menu select Part Setup >> then your desired option. These are described below.

Some menu items are only available to advanced level users.



1	Advanced Adjust Lighting (on page 155)
2	Basic Adjust Lighting (on page 154)
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 150) - Determine the gray shade value for any pixel or group of pixels in your image.
7	Part Width Calibration (on page 108) - 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	Select Measurements for SPC - not currently used.

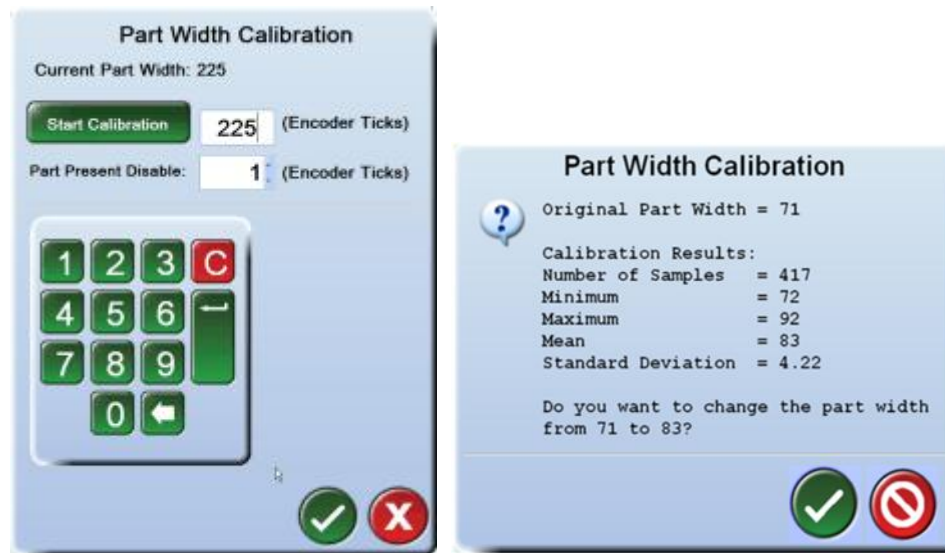
Part Width Calibration

Part Width is the number of encoder pulses that the part detect sensor "sees" the part. For an illustration of Part Width within the inspection process, refer to the *sequence of events* (see "*Sequence of Events During Inspection*" on page 182).

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 147).
2. Select Part Tracking, then select Part Width Calibration.



To calibrate the Part Width:

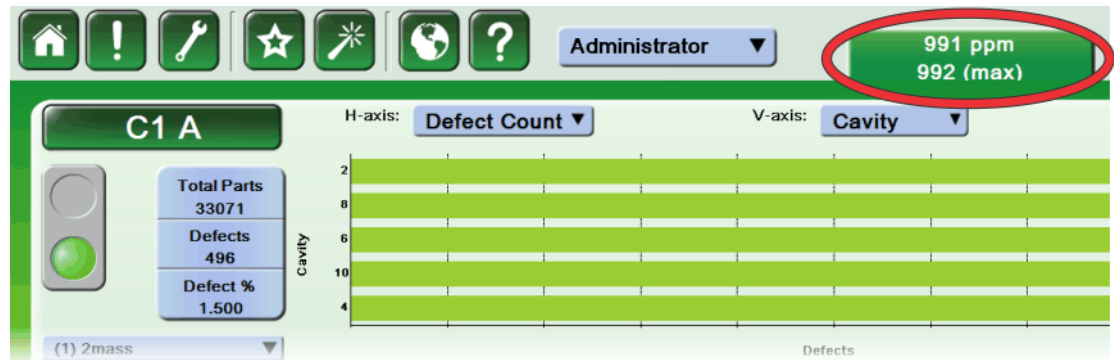
1. With parts running under the camera, click **Start Calibration**. As each part goes by its part width will be displayed in the window next to the Start button.
2. After a sufficient number of parts have gone by (we recommend about 10 parts), click **Stop Calibration** (same button as Start Calibration). This will display the calibration results (shown above right).
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 click the 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.

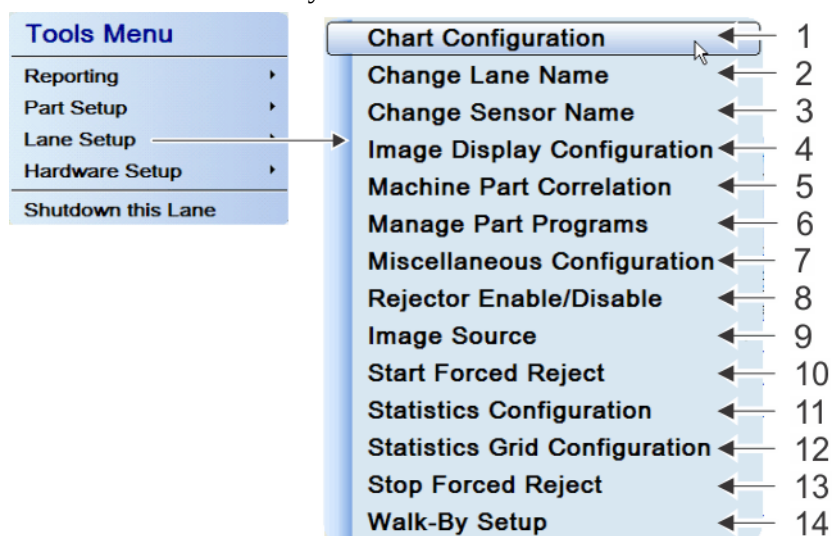
The part rate displays:

- 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.



1	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.
2	Change Lane Name - Change the name of the current lane.
3	Change Sensor Name - Change the name of the selected sensor.
4	Image Display Configuration (on page 112) - Set the frequency, rotation, and other display options for the sensor images.
5	Machine Part Correlation (on page 112) - 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)
6	Manage Part Programs (on page 114) - Create, delete, or edit part programs.
7	Miscellaneous Configuration (on page 118) - Change settings for Missed Results, Inspection Warnings, and Defect Database (not currently available).
8	Rejector Enable/ Disable (on page 118) - Enable or disable the rejector for lane or sensors.
9	Image Source (on page 158) - Select images to display on the lane.
10 and 13	Start Forced Reject (on page 120) - Force parts to be rejected based on correlation to a specific machine part. Stop Forced Reject - Stop the Forced Reject process.
11	Statistics Configuration (see " Statistics Grid Configuration " on page 79) - Change the display settings for the charts displayed by the Statistics buttons.
12	Statistics Grid Configuration (on page 122) - Change the amount of information for the charts displayed by the Statistics buttons.
14	Walk By Setup (on page 60) - 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.

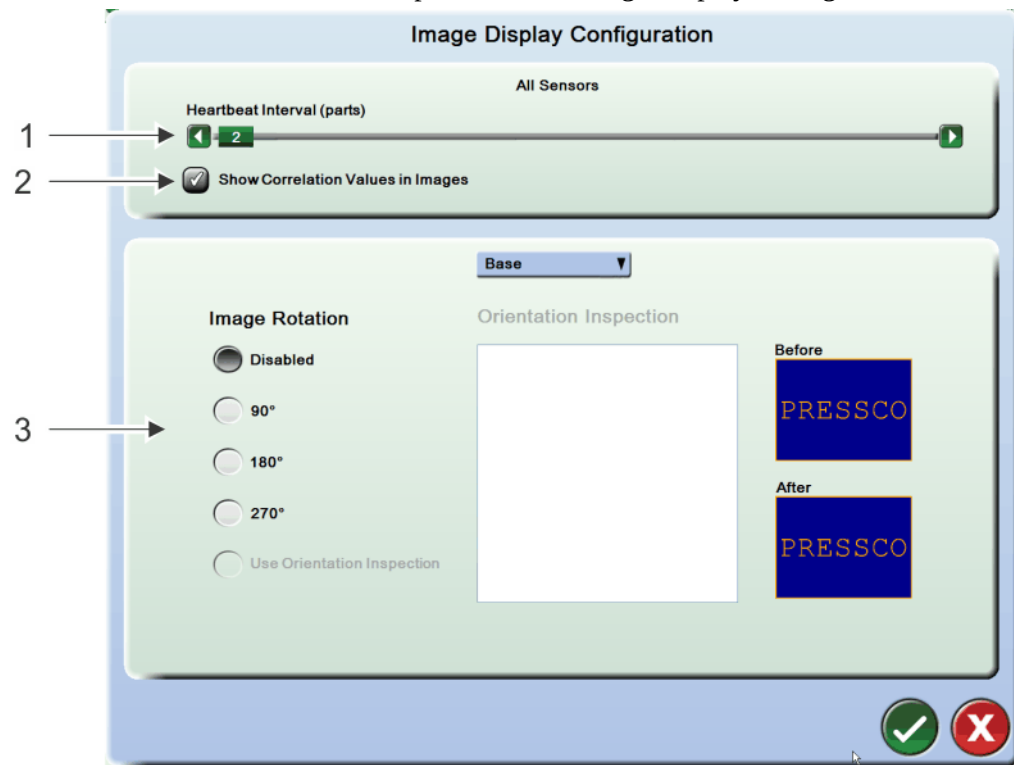
Image Display Configuration

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	If correlation is used, check this box to display correlation information in the Big Live Image view.
3	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.

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 may 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).

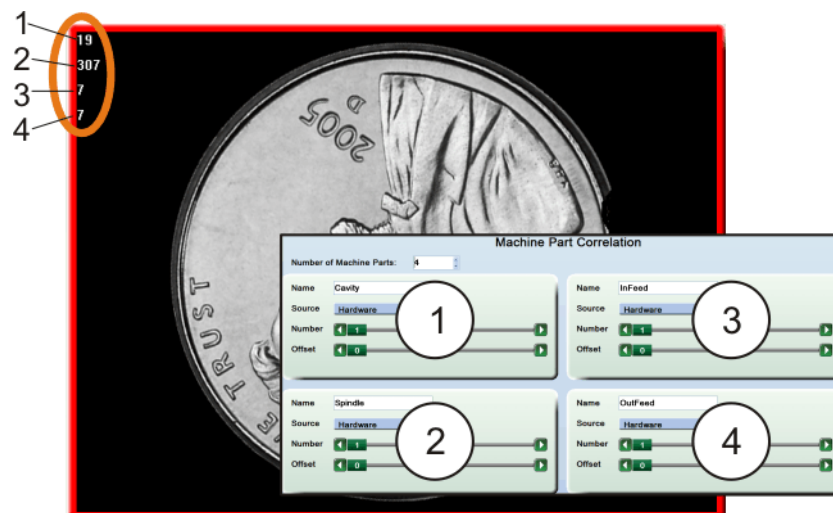
Note: There is no index sensor for MP4 in the hardware configuration.

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:

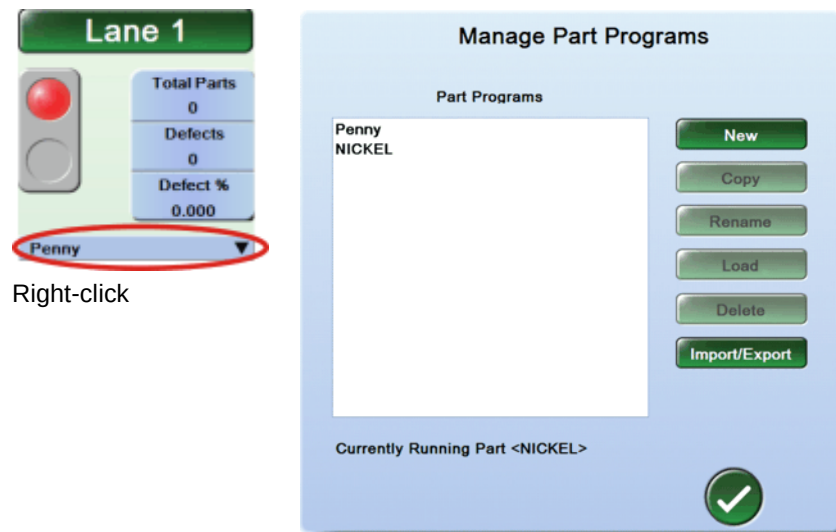
- **How to Create, Copy, or Import a Part Program** (on page 182)
- **Export a part program** (on page 116)
- **Load a Part Program** (on page 116)

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.

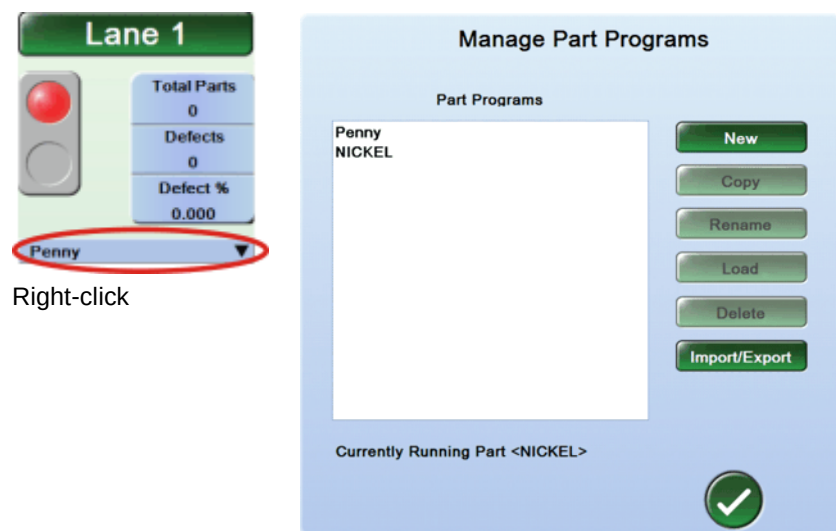


LOAD A PART PROGRAM

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

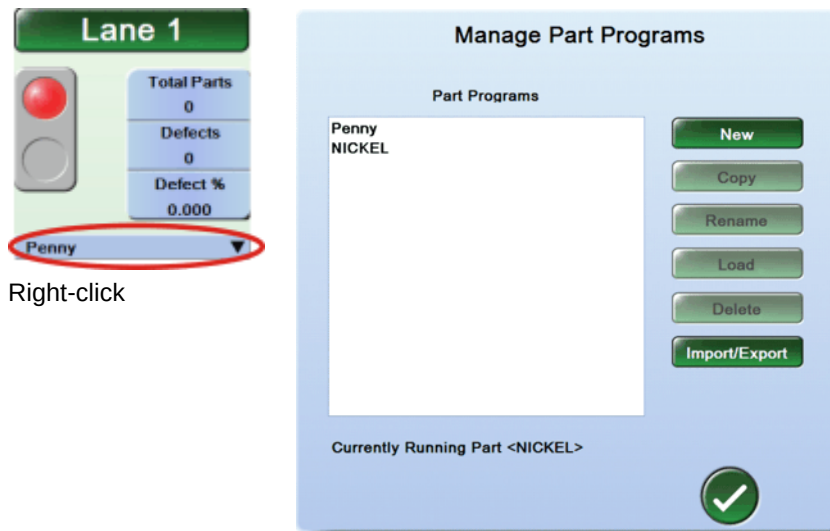
To load a part program:

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.

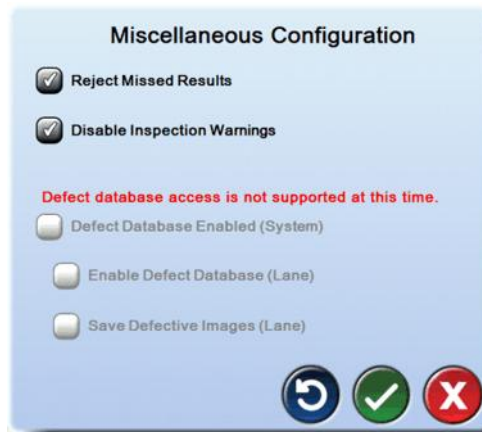
Miscellaneous Configuration

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, then select Lane Setup, then select Miscellaneous Configuration.



Reject Missed Results

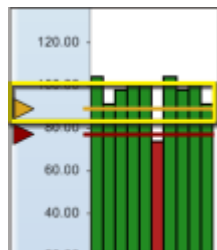
A missed result occurs if the system misses the inspection results of a part. This can happen if the inspection time is too long or if the system is too busy to process all the data before the part reaches the reject station.

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.

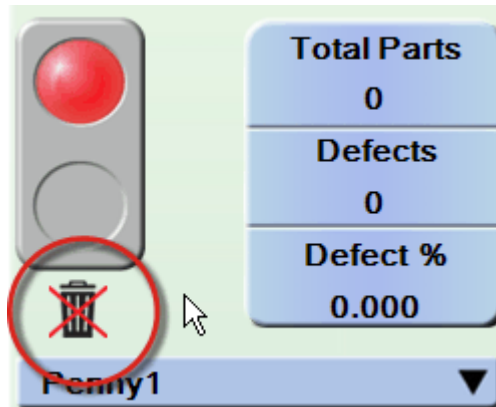
The warning limits are represented by the yellow adjustable slider bar on the Retro-Spec graphs. If you do not wish to use warning limits, check the Disable Inspection Warnings box.



Rejector Enable/ Disable

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

- If one or more Sensors is 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. Click the tools icon 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.

- 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 are 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 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

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

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 criteria.

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 criteria.

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 criteria.

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 criteria.

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 is 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:



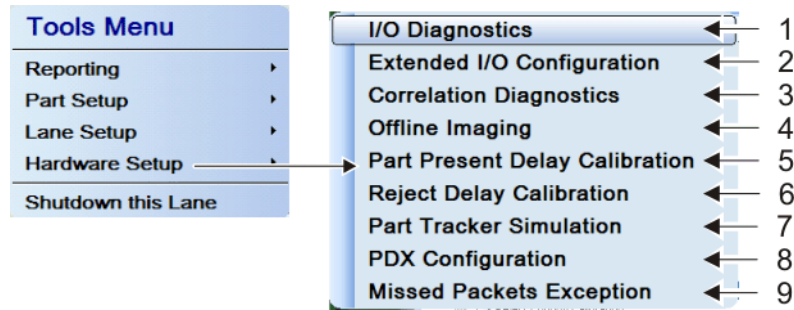
From the Lane or Sensor Overview screen, click the Tools button to see the Tools menu, then select Lane Setup, then select Statistics Grid Configuration.



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/O Diagnostics (on page 124) - Verify the presence of input and output signals.
2	Extended I/O Configuration (on page 300) - Configure the optional Extended I/O board.
3	Correlation Diagnostics (on page 125) - Verify correlation signals.
4	Offline Imaging (on page 150) - Choose how the Intellispec acquires images when the lane is offline.
5	Part Present Delay Calibration (on page 126) - Calibrate the distance (in encoder pulses) from the part detect sensor to the camera centerline.
6	Reject Delay Calibration (on page 128) - Calibrate the distance (in encoder pulses) from the part detect sensor to the rejector.
7	Use part tracker simulation (on page 131) for troubleshooting or if a part detect sensor is bad. A simulated part rate would allow inspection to continue.
8	PDX Configuration - Set up the part detect generator. Only used in some applications.
9	Missed Packets Exception (on page 134) - Set the number of missed packets to trigger the part tracker to send a Lost Part Tracking message to the Intellispec.

I/O Diagnostics

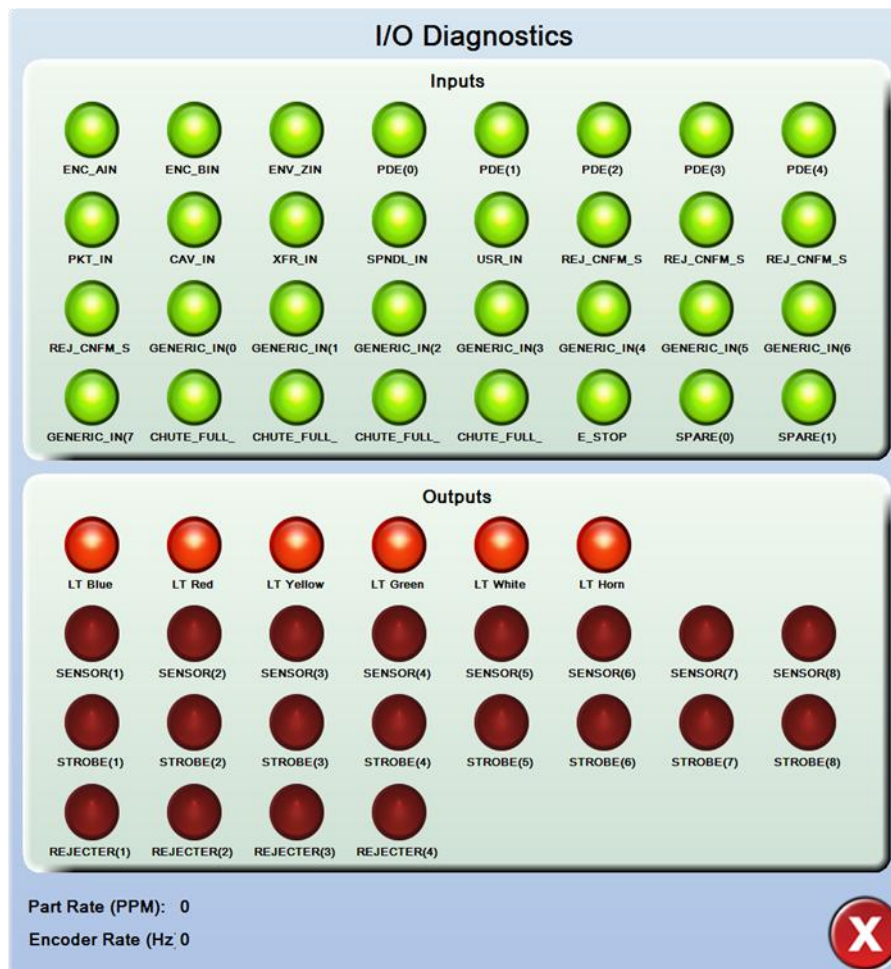
To get to this screen:



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.

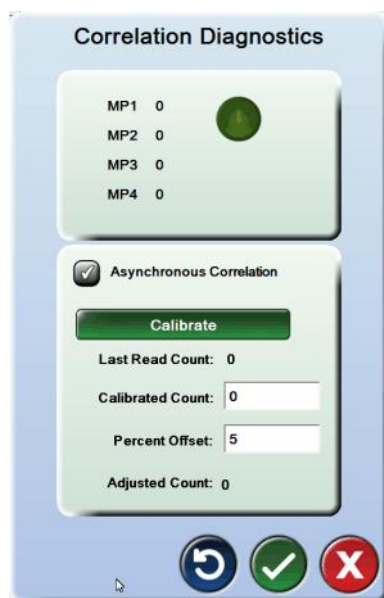
Correlation Diagnostics

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 112) screen.

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

Asynchronous Correlation FHCP 3X (on page 269), and **Asynchronous Correlation Software Setup FHCP 3X** (on page 271).

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 before Part Present Delay.*

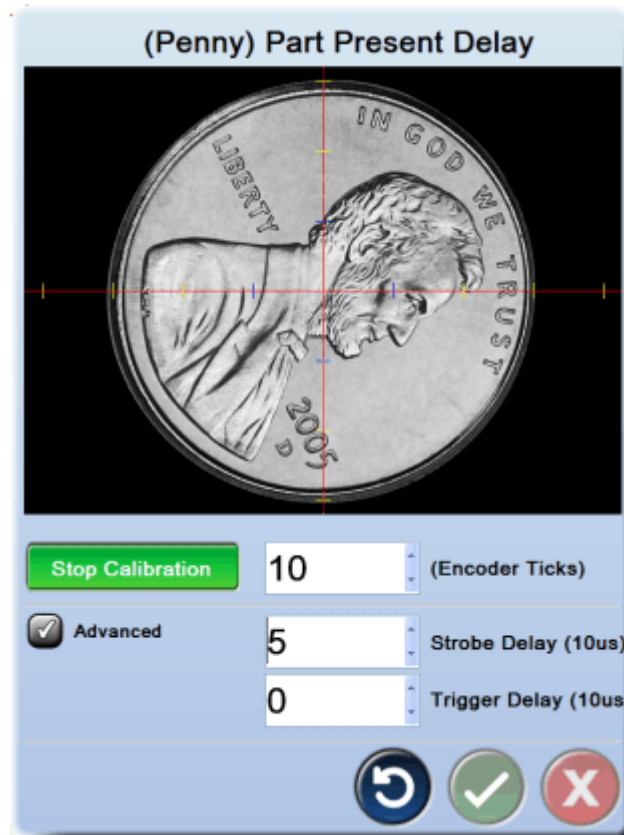
The Part Present Delay ensures that your part is in the center of the image when the camera snaps its picture. Depending on the orientation of your camera, your part could be moving from left to right, right to left, top to bottom or bottom to top as it travels through the camera's field of view. You 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 182).

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 147).
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 157) 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 182).

Reject Delay Calibration

Reject Delay [encoder ticks] 650

Rejector 1

☐ Encoder Based Dwell

☒ Time Based Dwell

Reject Dwell [ms] 150

☒ Use Adaptive Reject

Turn-on Time [ms] 0

Diff. from Calibration [%] 0

Start Calibration

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 147).
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 130)

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:

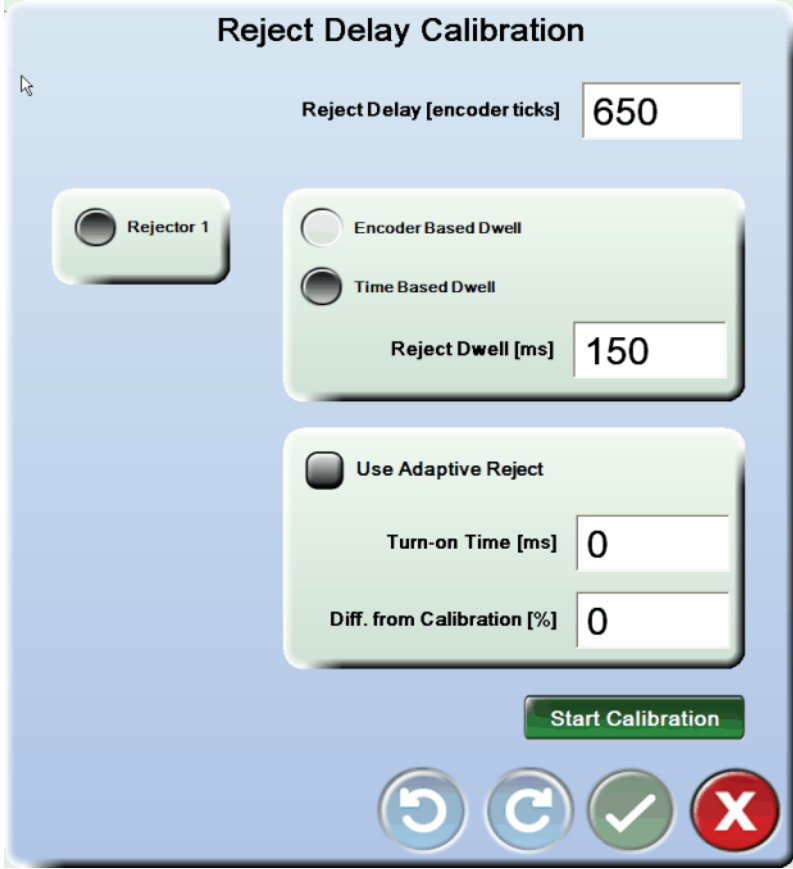
- Calibrate the Reject Delay when the conveyor or production line is running at a constant speed -- not during a startup or stopping
- Calibrate the Reject Delay at the fastest possible conveyor or production line speed that you will use, if possible. Then use a value of 0 - 10 for Diff. from Calibration (%) (see more information about Diff. from Calibration % below)

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

To set Adaptive Reject:

1. Click the check box next to Use Adaptive Reject in the ***Reject Delay Calibration*** (on page 128) menu to enable the feature.
2. Enter the Turn On time of the reject device installed in your system.
3. Enter a value for Diff. from Calibration %, if applicable. See more information below.
4. Set the Reject Dwell reference to Encoder Based or Time Based, and set the Reject Dwell if it has not already been set.

5. Click the OK button  to save changes and exit the Reject Delay Calibration menu.



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

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

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

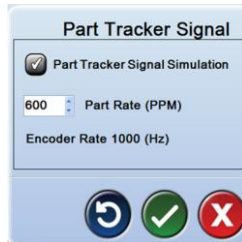
Part Tracker Simulation

Use **part tracker simulation** (on page 131) 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.

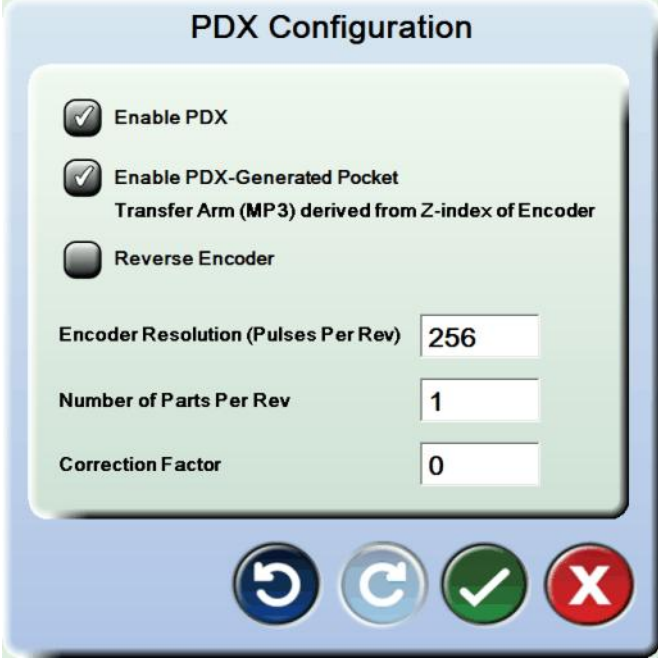
Part Rate - Enter a simulated part rate in parts per minute (PPM).

❖ *Note: the system cannot run in both PDX mode and **Part Tracker Simulation** (on page 131) 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 mode and **Part Tracker Simulation** (on page 131) 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.*

The image shows a software dialog box titled "PDX Configuration". It has a light blue border and a light green background. At the top, the title "PDX Configuration" is centered. Below the title, there are three checkboxes: "Enable PDX" (checked), "Enable PDX-Generated Pocket" (checked), and "Reverse Encoder" (unchecked). Below the checkboxes, there are three input fields: "Encoder Resolution (Pulses Per Rev)" with the value "256", "Number of Parts Per Rev" with the value "1", and "Correction Factor" with the value "0". At the bottom of the dialog, there are four circular buttons: a blue button with a circular arrow, a light blue button with a circular arrow, a green button with a checkmark, and a red button with an 'X'.

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 107) 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.

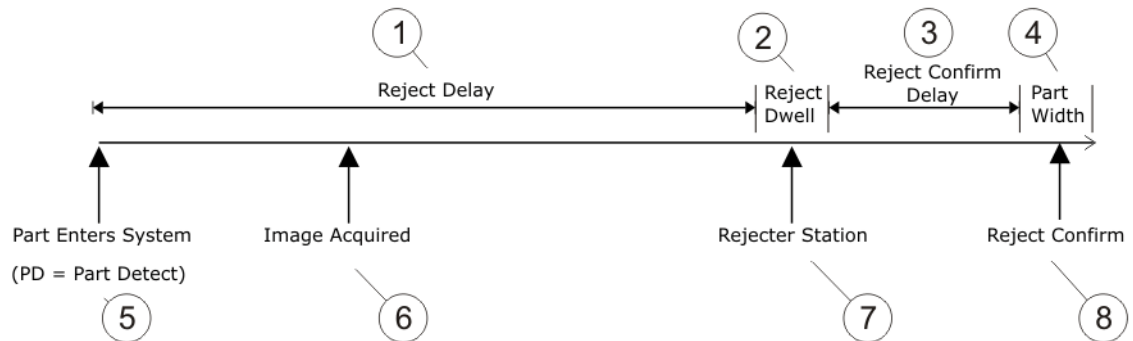
Reject Confirm Calibration

Reject Confirm can detect missed rejects. Coupled with the **Missed Reject Alarm** (see "**Lane Alarms Description**" on page 93), Reject Confirm will reliably detect and notify you of any missed reject condition. 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 93) 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 128)
2	Reject Dwell (see " Reject Delay Calibration " on page 128)
3	Reject Confirm Delay, set by Reject Confirm Calibration
4	Part Width (see " Part Width Calibration " on page 108)
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 91) to enable the alarm.

2 - CALIBRATE STANDARD REJECT DELAY

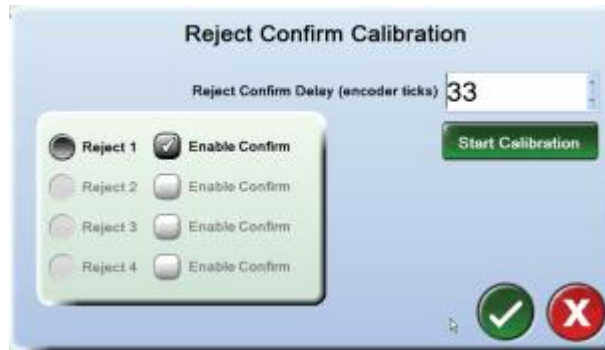
Calibrate the standard **reject delay** (see "**Reject Delay Calibration**" on page 128) using normal procedures.

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 147).
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. $\text{Reject Confirm Delay} = (\text{number of pulses from Part Detect to Reject Confirm Sensor}) - \text{Reject Delay}$.

Chapter 9

SOFTWARE UTILITIES

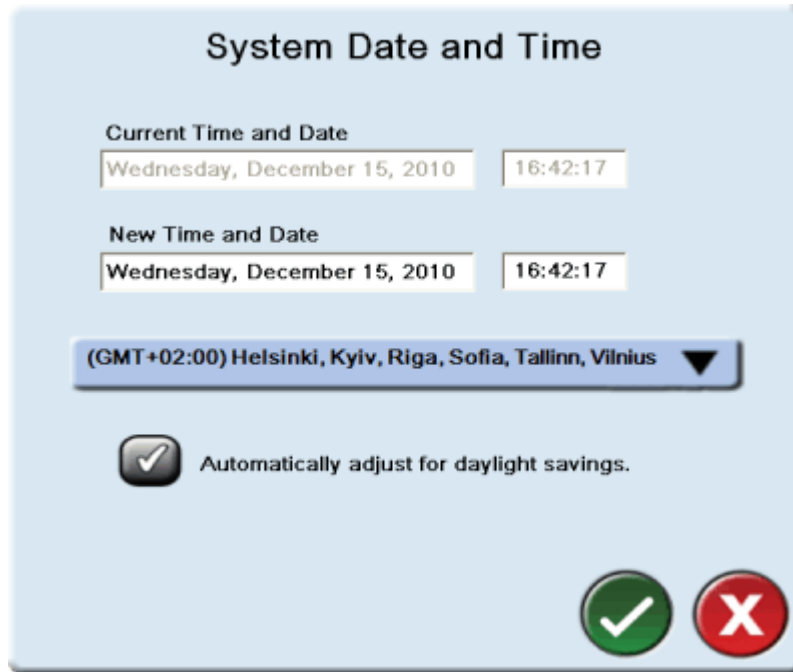
This section includes various software utilities that assist with Windows settings, help and support from Pressco, and sensor configuration.

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.

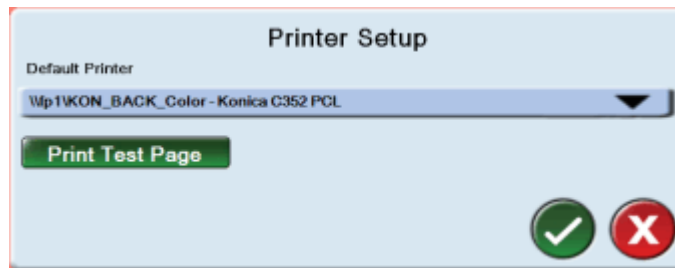
SETTING UP A PRINTER

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 **How to Save Images** (on page 163).*

What you need:

- **Mechanical keyboard (MKB)** (on page 32) 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:

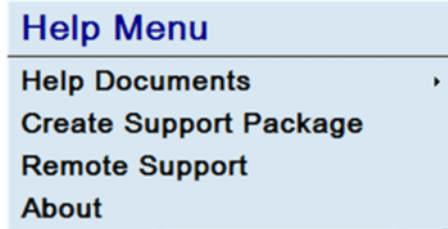
- Connect the mechanical keyboard (MKB) to the convenience **USB port** (see "**FHCP 3X User Interface Hardware**" on page 257) on the side of the user interface.

To create the support package:

1. Click a Lane n button or Sensor button to go to the Lane Overview or Sensor Overview screen.



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



3. Select the Create Support Package option. The support package wizard is displayed.
4. Follow the instructions on screen.



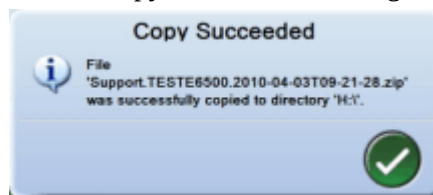
5. Use the forward arrows to move to the next screens.
6. When asked to describe the problem, use the mechanical keyboard to enter information.
7. Optional: At Step 3: Configure, check the Custom Configuration box. A .pcf file is custom Pressco configuration file that gathers additional information (beyond 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.
8. When the steps are completed, verify that the Step 5: Export screen is displayed.



9. 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.
10. Click the Copy button. The support package files are copied to the USB flash drive, then a "Copy Succeeded" message is displayed.



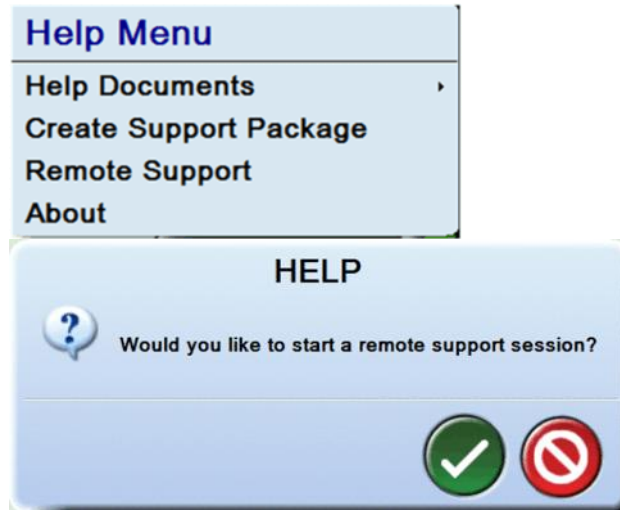
11. Click the OK button  to continue.
12. Click the OK button  at the bottom of the Support Packaging screen to exit.
13. Remove the USB flash drive.
14. Remove the mechanical keyboard (MKB).
15. Send the support package files to Pressco.

To send the files to Pressco:

1. Copy the files that were saved, including images, from the USB drive to your computer.
2. Send an e-mail to **service@pressco.com** (**<mailto:service@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. This is the method used by Pressco to provide remote system support if a Maintenance Agreement is purchased for that Intellispec. With this software Pressco can log in and operate the Intellispec remotely.



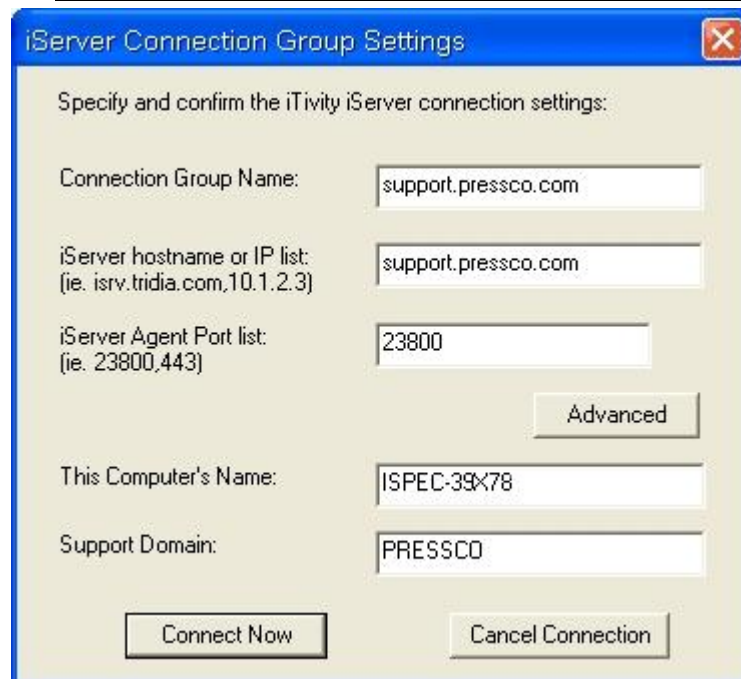
You will need:

- 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. Contact your network administrator for help.

To use Remote Support:

1. Notify a **Technical Support** (see "**How to Contact Pressco**" on page 335) 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 . If you see the Help menu, select Remote Support.
3. When prompted to start a remote support session, click the OK button . A connection box is displayed.

! *Important: Do not change any of the settings in the connection box. They have been set up during installation.*



The dialog box is titled "iServer Connection Group Settings". It contains the following fields and buttons:

- Connection Group Name: support.pressco.com
- iServer hostname or IP list: support.pressco.com (ie. isrv.tridia.com,10.1.2.3)
- iServer Agent Port list: 23800 (ie. 23800,443)
- Advanced button
- This Computer's Name: ISPEC-39X78
- Support Domain: PRESSCO
- Connect Now button
- Cancel Connection button

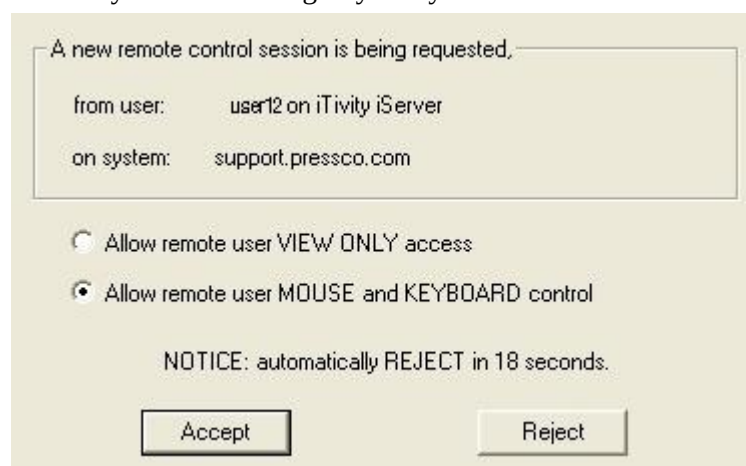
4. Click Connect Now. The connection status will change. This means that the Tech Support representative can now connect to your Intellispec.



The dialog box is titled "iTivity Live Support Agent Connection Status". It displays the following information:

- support.pressco.com Connection Status
- Connected from agent: ISPEC-39X78/Mycomputer/123.456.789
- Connected to iServer: support.pressco.com: server
- Session Established to support.pressco.com.
- The Session Id is 13df5de.
- A green icon with a red 'X' and a wrench.

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



The dialog box displays the following information and options:

- A new remote control session is being requested.
- from user: user12 on iTivity iServer
- on system: support.pressco.com
- ☐ Allow remote user VIEW ONLY access
- ☒ Allow remote user MOUSE and KEYBOARD control
- NOTICE: automatically REJECT in 18 seconds.
- Accept button
- Reject button

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

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

To disconnect from remote support:

1. Click the X in the upper right corner of the 'iTivity Live Support Agent Connection Status' box.
2. When the system asks "Do you really wish to exit the iTivity Live Support Agent?" 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.



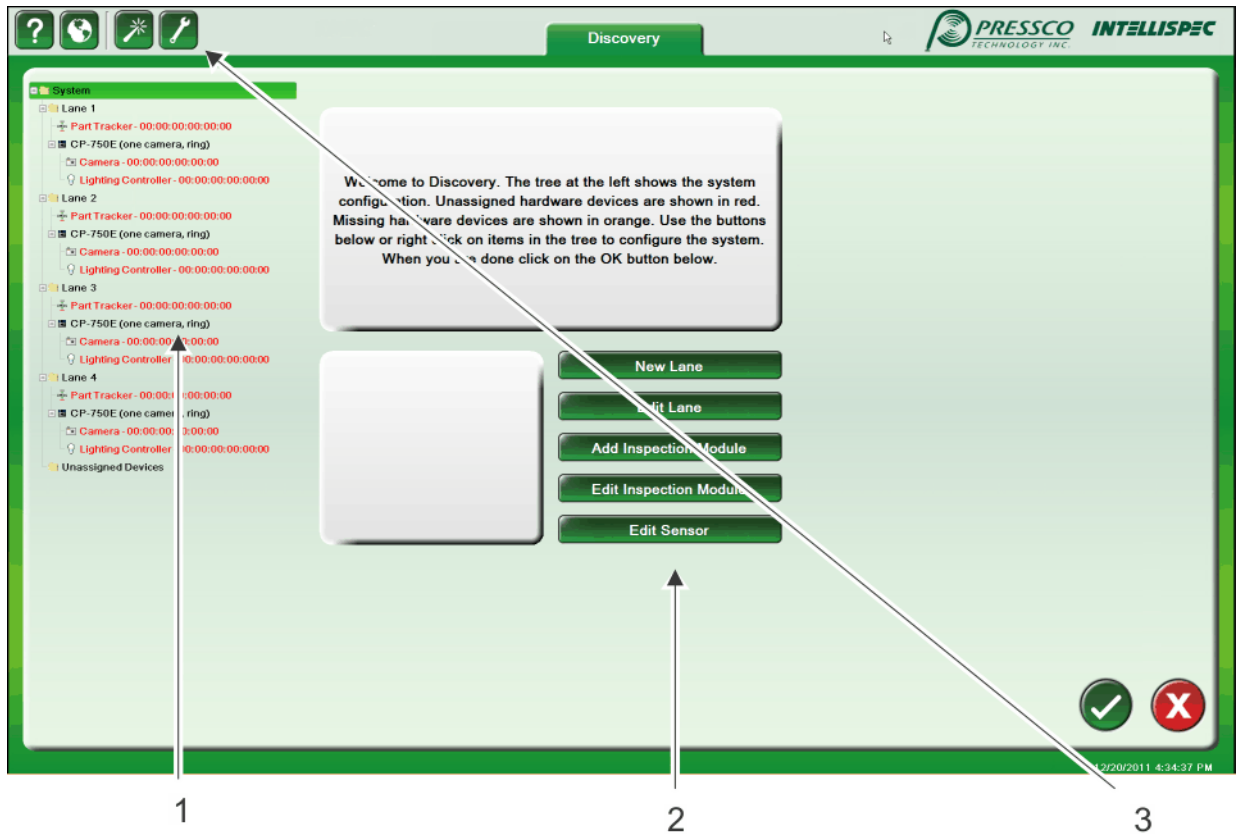
DISCOVERY SOFTWARE - WHAT IS DISCOVERY?

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.*
-

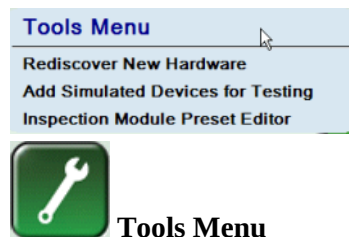
Additionally, during system startup, if a previously configured component fails to communicate with the Intellispec software, the discovery software screen will automatically appear on the user interface, alerting you to the problem.

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 144) 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.

Favorites Menu

Take Screen Shot

Defect Database

This menu allows you to access the following utilities:

Take Screen Shot (on page 146)

Defect Database Tool (see "**Defect Database Tool (option)**" on page 315)

❖ *Note: the Defect Database is not available from System Overview mode.*

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 163) 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.

Chapter 10

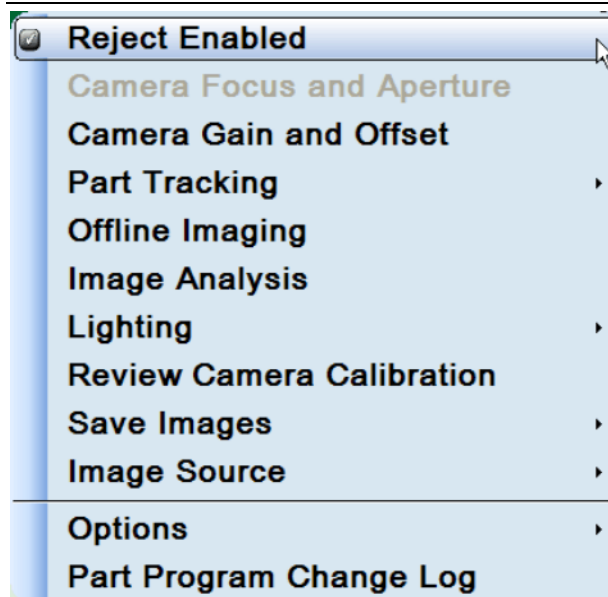
LIGHTING AND IMAGING

This section includes how to adjust lighting, how to save and load images, how to use Offline imaging, and how to use Image Analysis.

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 118).

Camera Focus and Aperture (on page 148)

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 126)
- **Reject Delay Calibration** (on page 128)
- **Reject Confirm Calibration** (on page 134)
- **Part Width Calibration** (on page 108)

Offline Imaging (on page 150)

Choose how the Intellispec acquires images when the lane is offline.

Image Analysis (on page 150)

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 154) and **Advanced Adjust Lighting** (on page 155).

Review Camera Calibration (on page 158)

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 163)

Allows you to save captured images to disk.

Image Source (on page 158)

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 192)

Provides different inspection tree views.

Part Program Change Log (on page 188)

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 even other part programs.

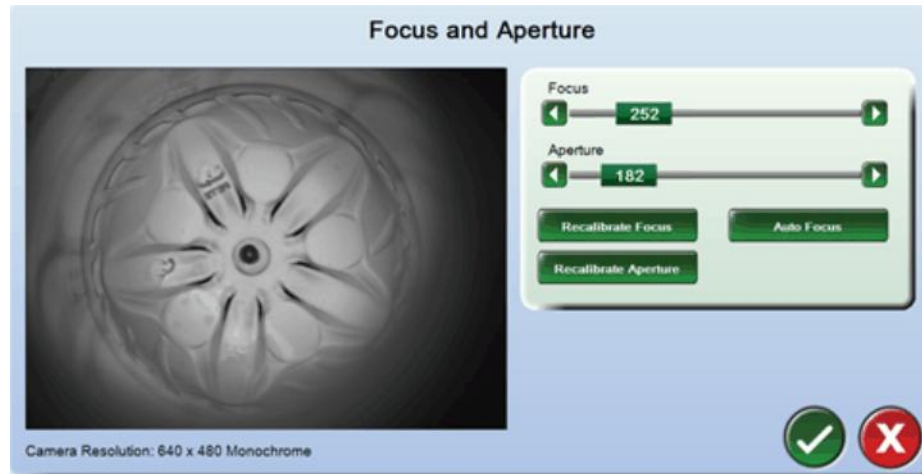
Camera Focus and Aperture

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

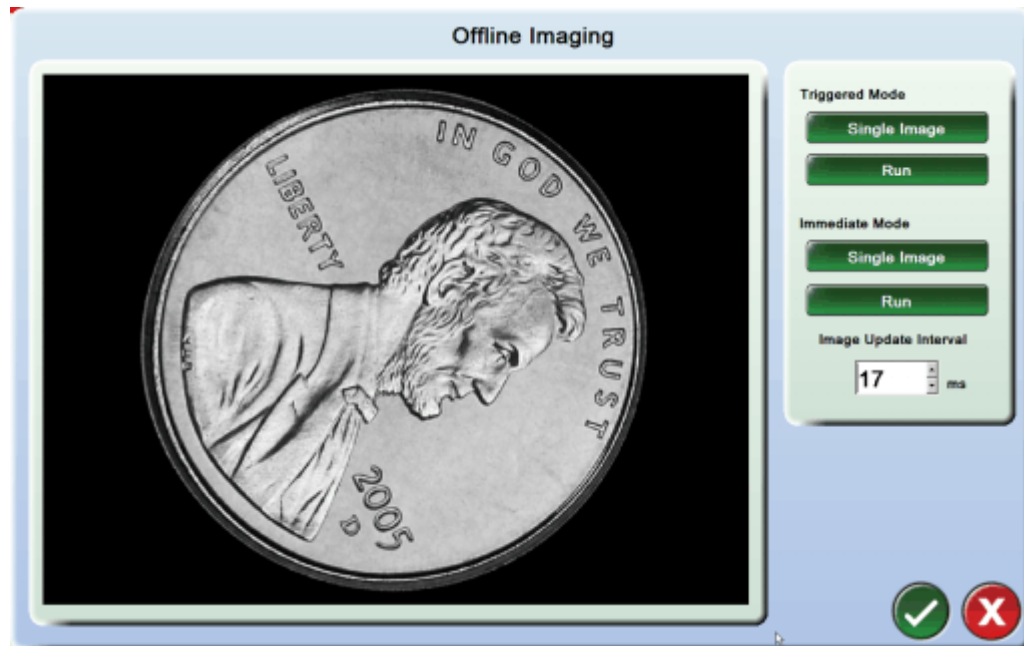
Determines and sets the usable range of aperture positions for the lens.

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

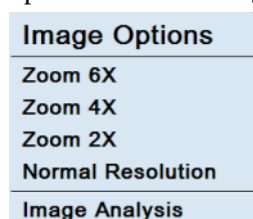
- **Single Image** – NOT using the part detect sensor, an individual picture is taken every time the button is clicked.
- **Run** – the camera takes a continuous picture, the light array is on, and you instantly see whatever is under the camera.

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.



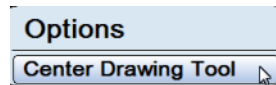
- OR -

- Right-click the **Sensor menu** (on page 147) and choose Image Analysis from the menu.

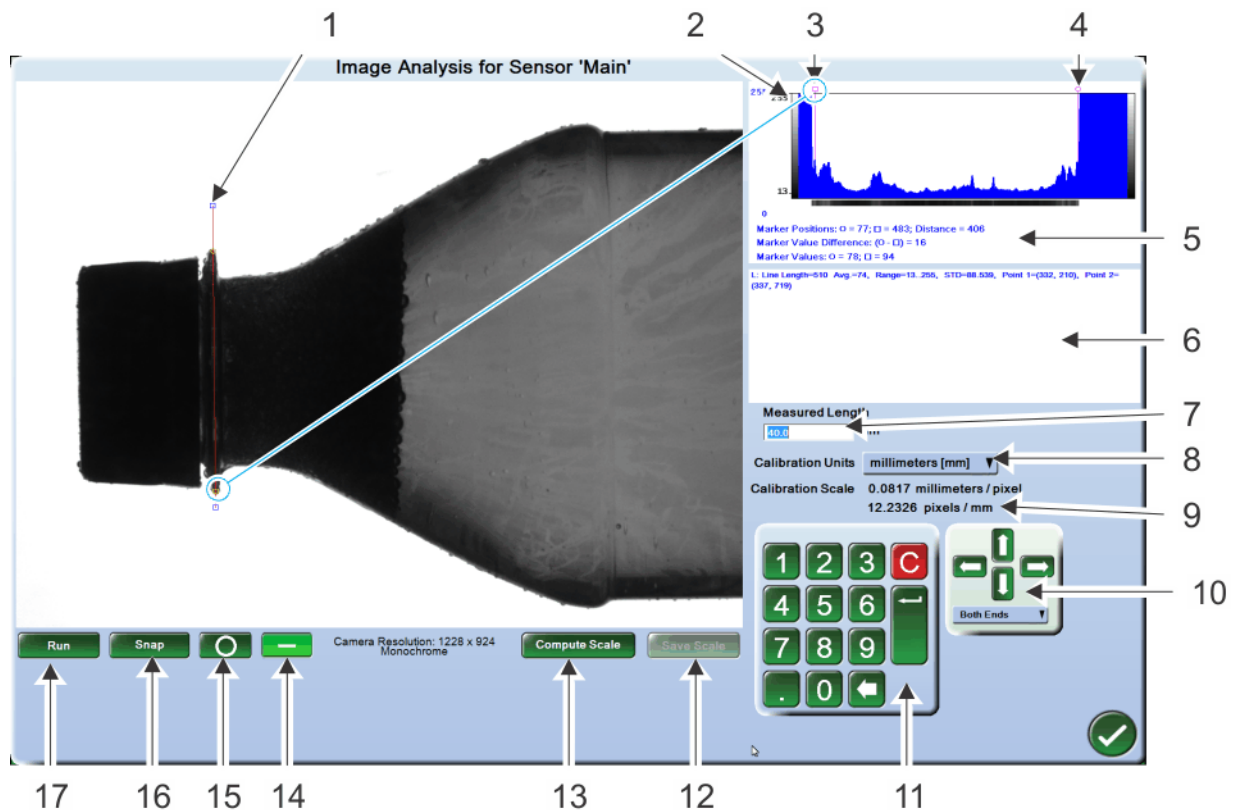
❖ *Note: you must have proper **user access** (see "**Managing Permissions**" on page 52) to use Image Analysis; otherwise, the option will be grayed out*

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 or circle.

Marker Value Difference

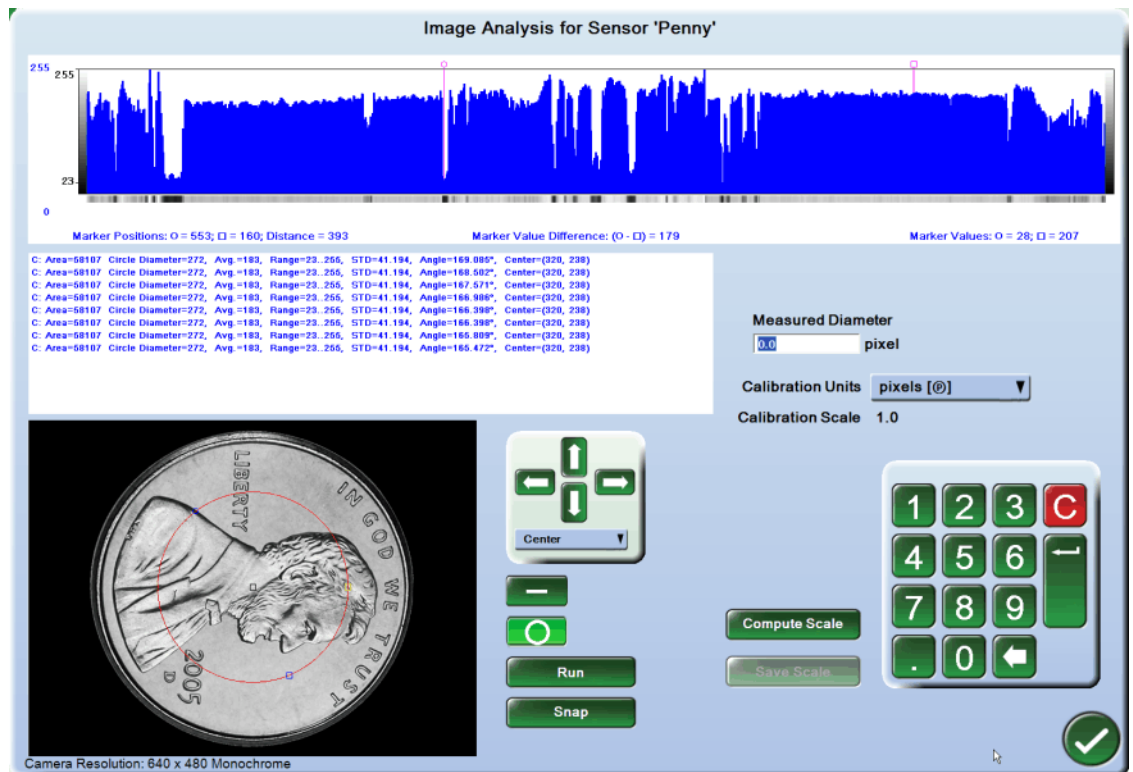
The difference in gray shade between the values of the two markers.

Marker Values

Gray shades of markers.

1	Click and drag an end square to change the size 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 end boxes of the line 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 150)):

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 end boxes 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** (on page 234)
- **Support Ring Registration** (on page 226)
- **Distance** (on page 250)

See the descriptions for the individual inspections using the links provided.

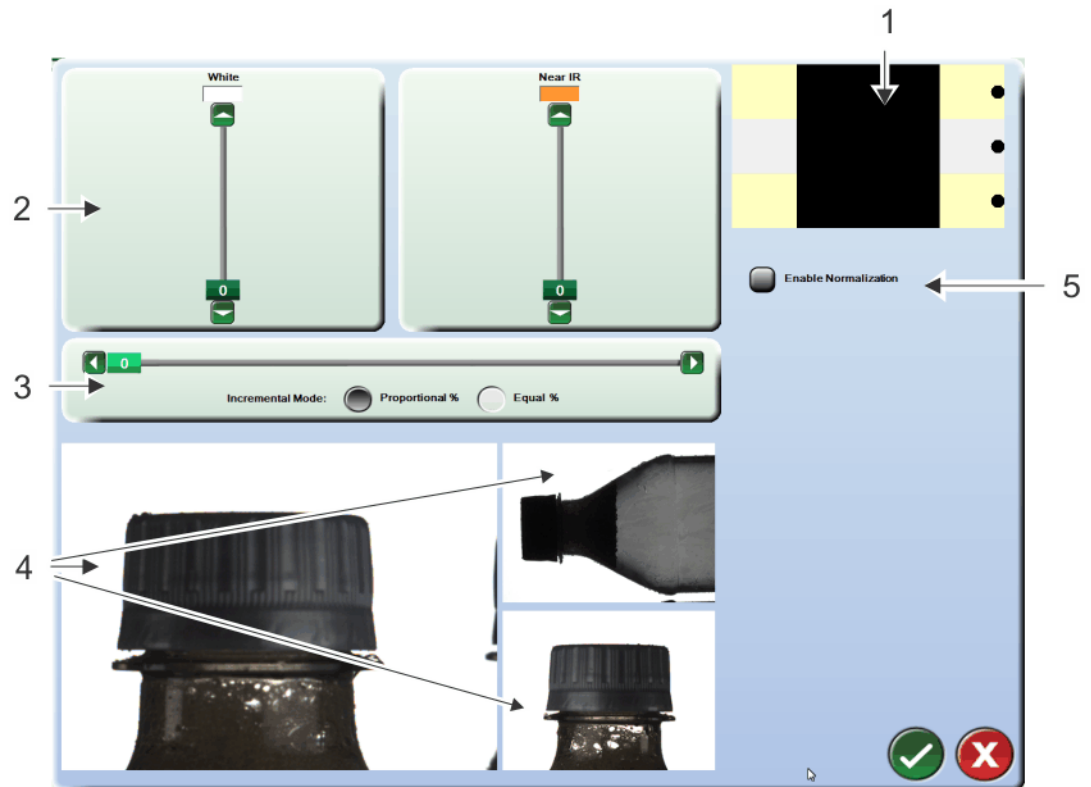
Basic Adjust Lighting

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 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.

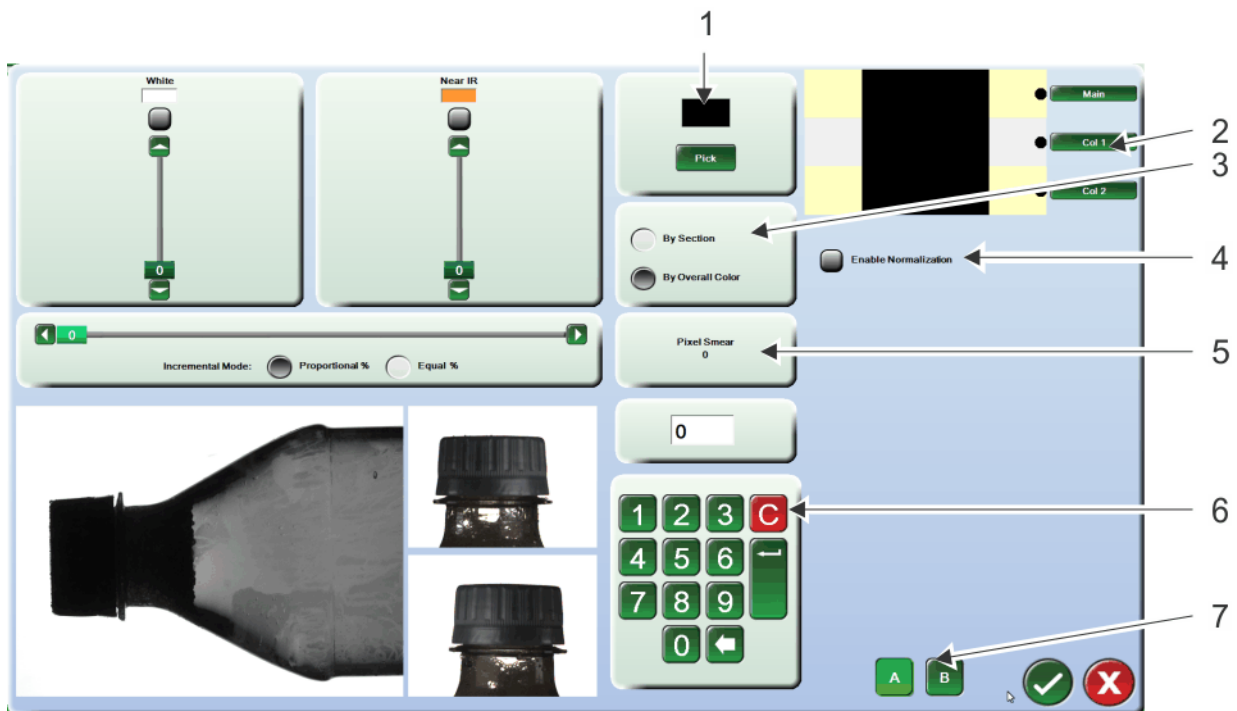
Advanced Adjust Lighting

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.

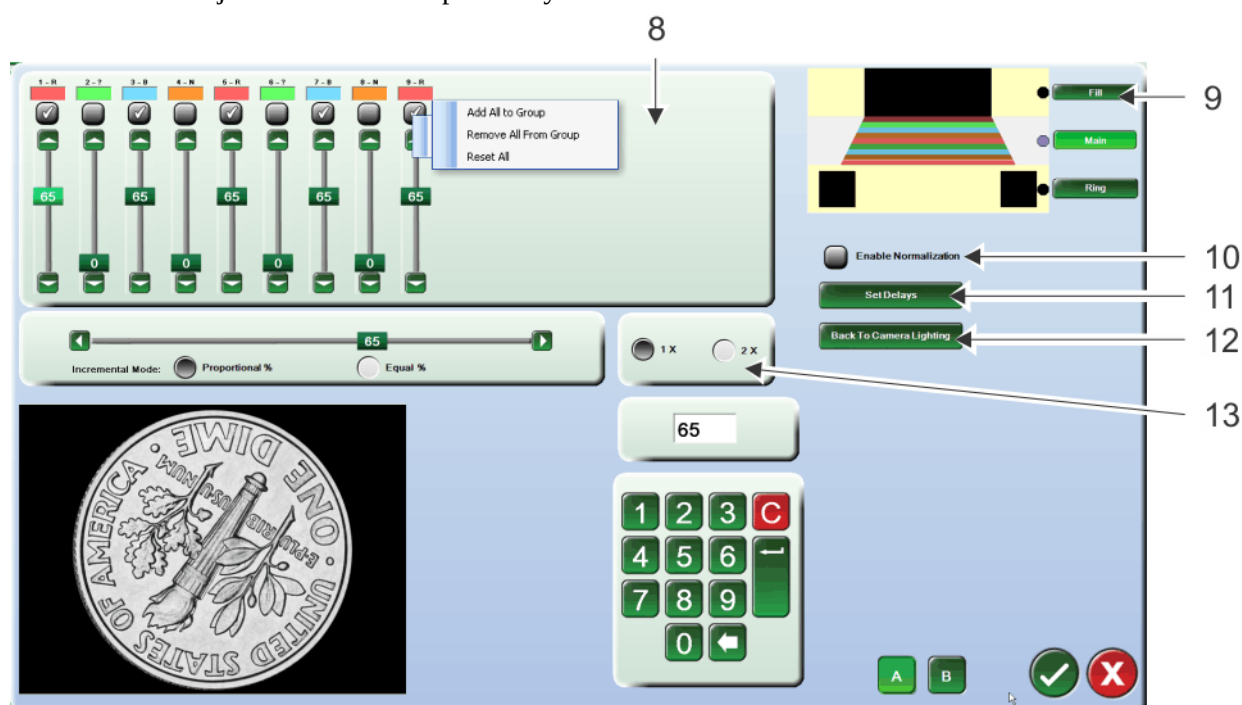


1	Opens a color palette and allows you to choose preselected colors.
2	If your inspection module has different lighting arrays, click one of the array buttons to adjust lighting by zone.
3	By Section - Allows you to change lighting by each individual section. By Color - Allows you to change lighting 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) - When a slide bar is selected, this keypad allows you to type in the desired number shown in the window above the keypad.
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 157) 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.

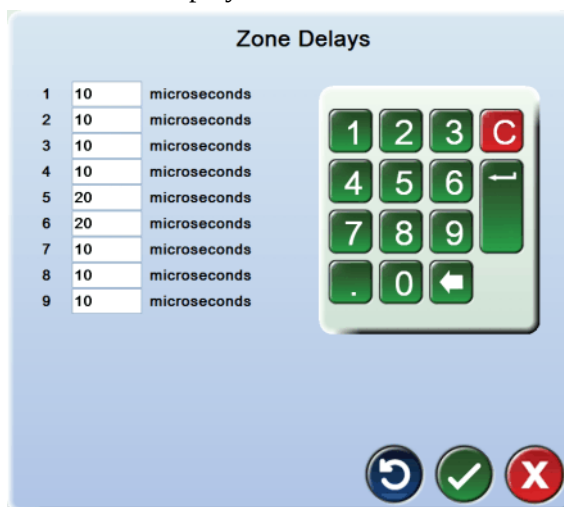
Advanced adjust lighting - set delay

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 lighting and imaging menu.
2. Select 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. Near the on screen keyboard (OSK), 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.

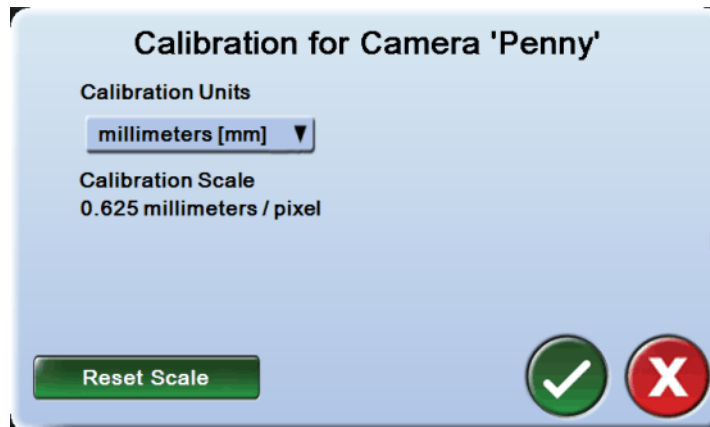
❖ *Note: this delay is separate from the Strobe Delay set in **Part Present Delay Calibration** (on page 126).*

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 150) 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.



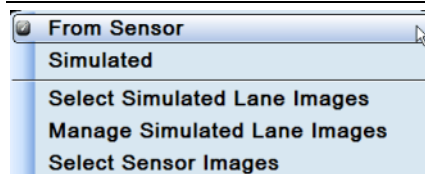
Notes:

- 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.

Image Source

This tool allows you to choose which images to display for the lane. 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

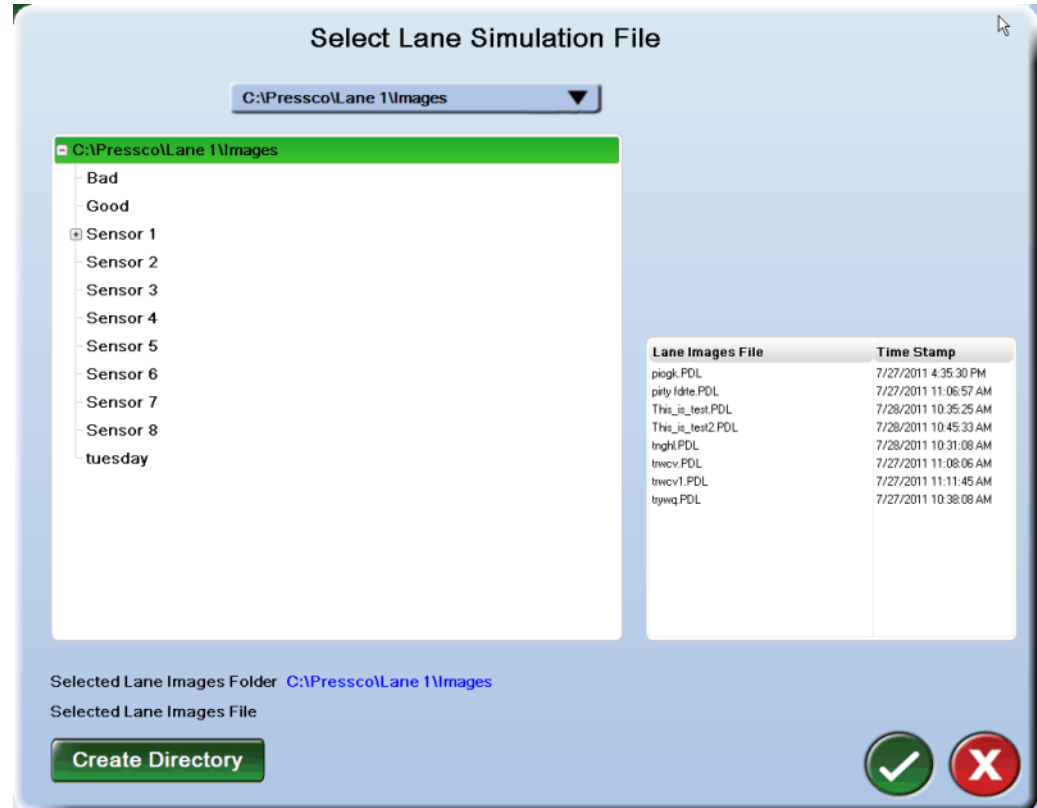
The system displays the live images from the current sensor.

Simulated

The system displays images you have previously saved to disk. You must specify images through one of the following options.

Select Simulated Lane Images

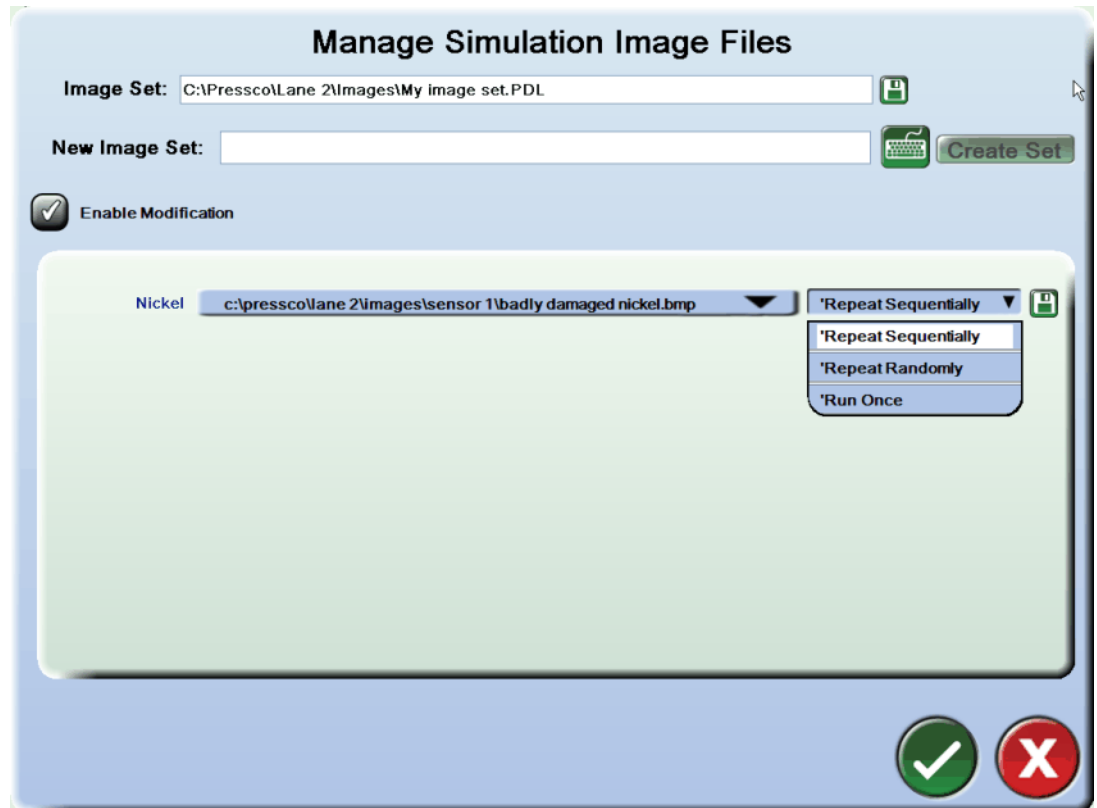
Choose which images to display. Browse through the available directories and click the OK button  to load the images from the selected directory. On the right side of this menu, you may see .PDL files that you have previously created. These files are lists of images that you can load any time. See **Manage Simulated Lane Images** (see "**Manage Simulated Lane Images (PDL)**" on page 159) to create .PDL files.



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. First, you must save a set of images; choose from one of the options: **How to Save Images** (on page 163)

To see this menu, right-click on a Sensor button in Lane or Sensor Overview mode to see the **Sensor menu** (on page 147), then choose **Image Source** (on page 158), then choose **Manage Simulated Image Files** from the menu.



To create a PDL file:

1. Click in the box for **New Image Set**. An on-screen keyboard is presented. Type a name for the image file and click the OK button from the on-screen keyboard.
2. Click the **Create Set** button. A file is created and saved in the default directory for the sensor (example: C:\Pressco\Lane 1\Images). The location will be displayed in the **Image Set** box.
3. To add images to the set, check the **Enable Modification** box, then click the disk icon  next to the 'Repeat Sequentially' drop-down menu.
4. Select images for the set using the instructions under the **Select Sensor Images** (on page 162) section. The drop-down menu next to the lane name (in this example: Nickel) will show the list of images you selected.
5. 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.

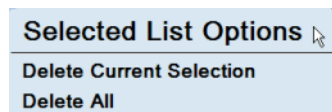
6. Exit from the **Manage Simulation Image Files** menu and put the lane online. The set of images in the PDL file is displayed.

To change an existing PDL file:

1. Click the disk icon  next to the **Image Set** box. The **Select Lane Simulation File** menu is displayed.
2. From the right side of the menu, select the PDL file that you want to change. Browse to a different directory if necessary. Click the OK button  to close the menu. 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 lane name. You can add or delete images as desired.

To delete images:

1. Click the drop-down menu next to the lane name to display the list of images in the PDL file, and select an image name. Release the trackball buttons or click outside of the menu to collapse the drop-down menu.
2. Right-click over the drop-down menu next to the lane name to see the **Selected List Options** menu.



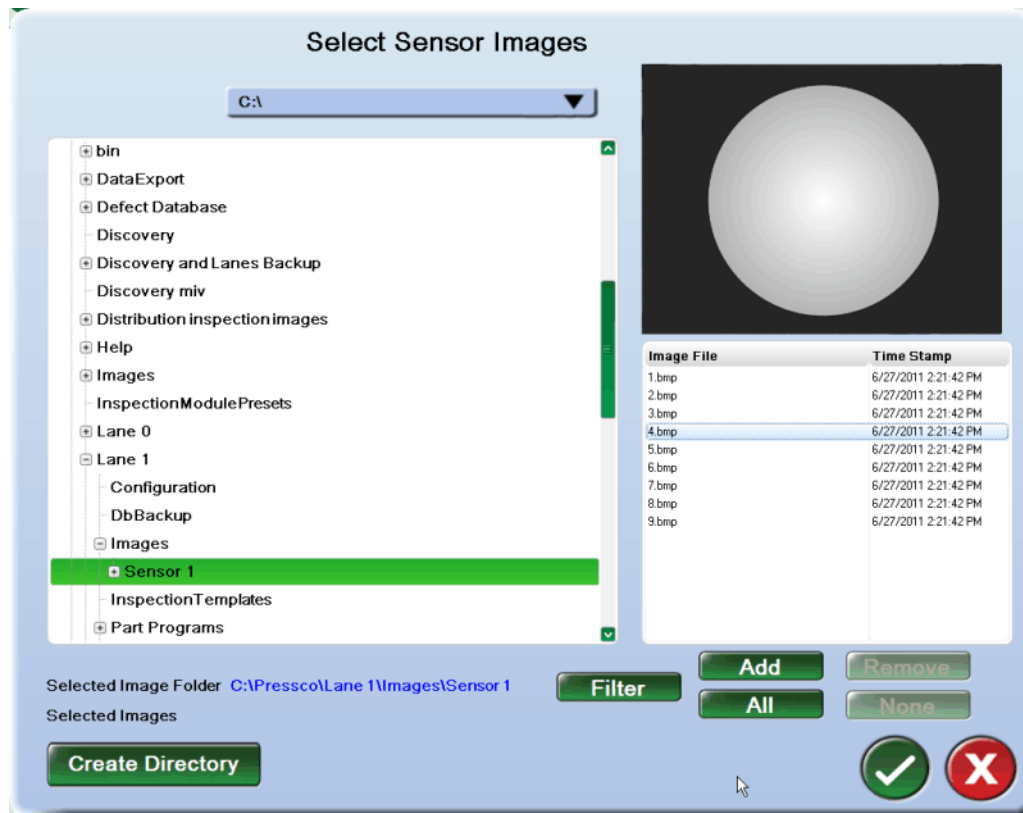
3. From the menu, choose to delete the currently selected image or all the images in the PDL file. The image(s) is deleted.

To add images:

1. Click the disk icon next to the 'Repeat Sequentially' drop-down menu. The **Select Sensor Images** (on page 162) menu is displayed.
2. Add or remove images by browsing through the directories, using the **Add** or **Remove** buttons.
3. Exit from the **Select Sensor Images** menu. The modified list of images is displayed in the drop-down menu next to the lane name.

Select Sensor Images

Select individual images or a group of images to display on the lane. 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.



To select images:

1. Browse through or create the directories using the drop-down menu at the top of the screen or the **Create Directory** button at bottom 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. Click the Add button to add the selected image(s) to the set of images to display. 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 and add more images. The drop-down menu next to **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.

HOW TO SAVE 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 159) 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 (except the Big Live Image). 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 163)

Saving Images Automatically (on page 165)

Saving Images through the Retro-Spec interface (on page 166)

Saving Individual Images While Editing an Inspection (on page 171)

Saving Reject Images (on page 172)

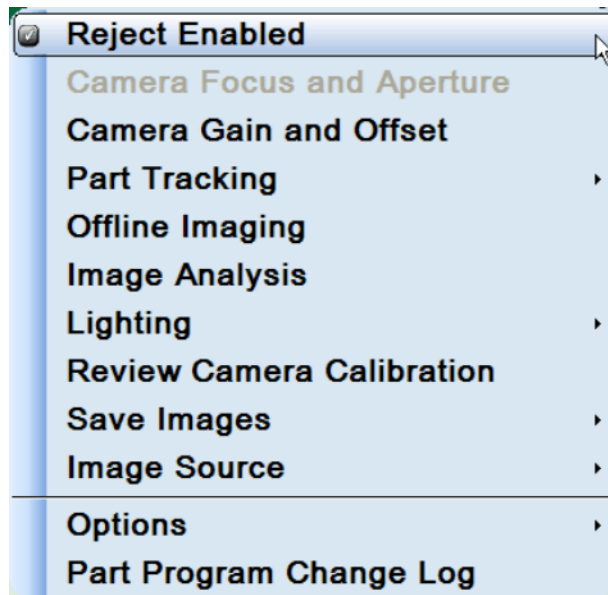
Saving a Region of Interest (Unwrapped) Image (on page 177)

Saving Images Through the Sensor Menu

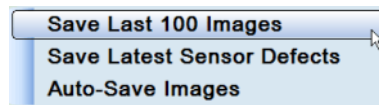
This tool allows you to quickly save a set of images from one sensor (up to 100 images). You can use these images to set up and test part programs. You can save images whether the lane is online or offline.

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 165)).



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 "Defect" 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.

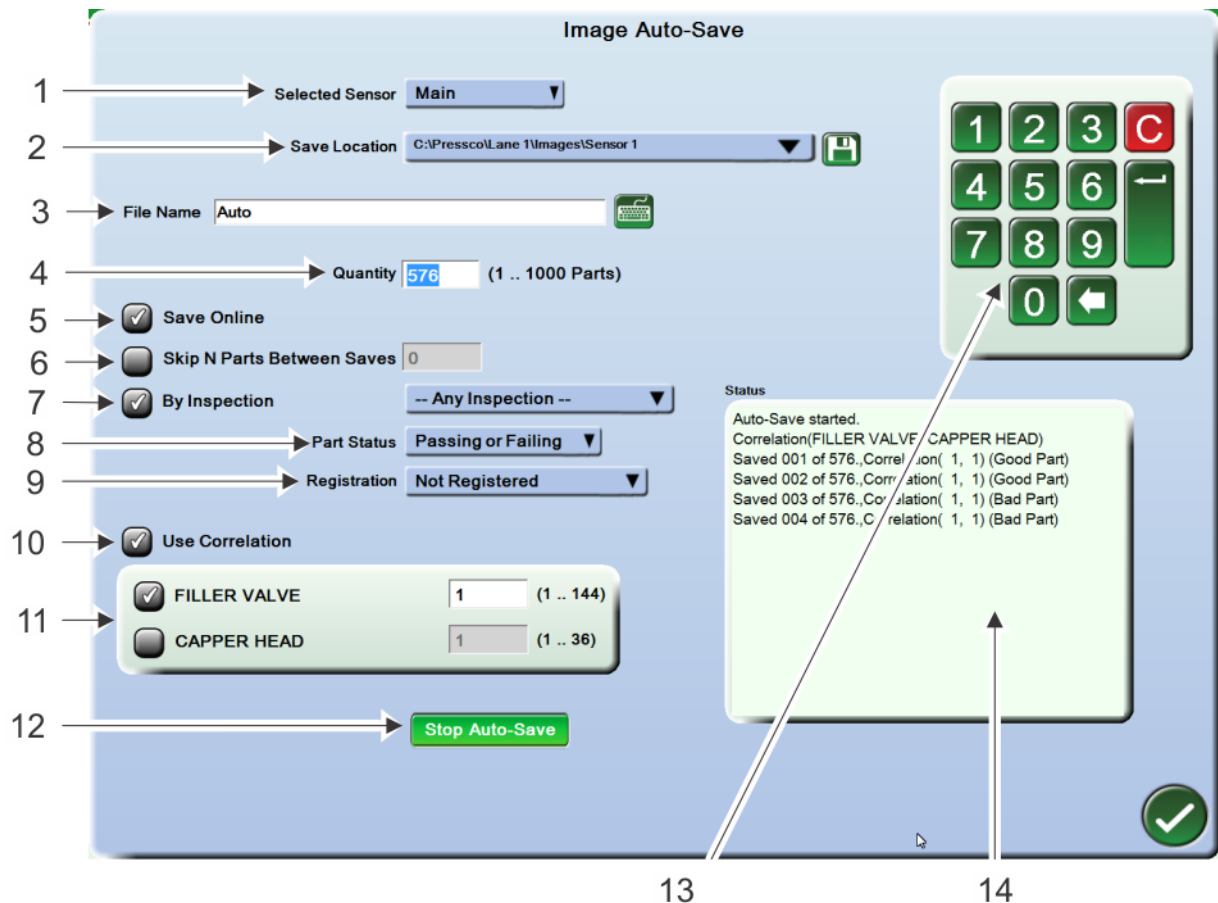
Saving Images Automatically

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.



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	Save Online - Check the box to enable auto-save. Images will only be saved when the lane is online.
6	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.
7	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.
8	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.
9	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].
10	Use Correlation - [available if the correlation option is installed] Check this box to enable saving images correlated to specific machine parts.
11	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.
12	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.
13	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].
14	Status - This area displays the status of the auto-save process.

Saving Images through the Retro-Spec interface

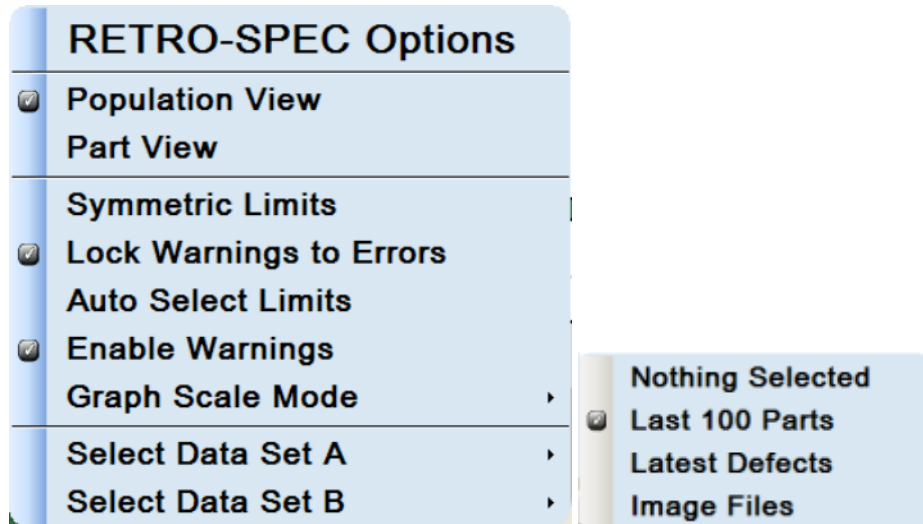
This topic covers how to save images through the Retro-Spec interface. You may want to save images to reference later, to send to Pressco for troubleshooting help, or to set up a part program. Saving images is done through the Retro-Spec interface from Registrations, Orientations, or Analyses. You must first have at least a temporary **Part Program** (see "**How to Create, Copy, or Import a Part Program**" on page 182) loaded. You must have user access 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.

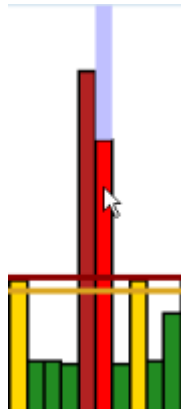
To save one or more images:

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 202) menu.

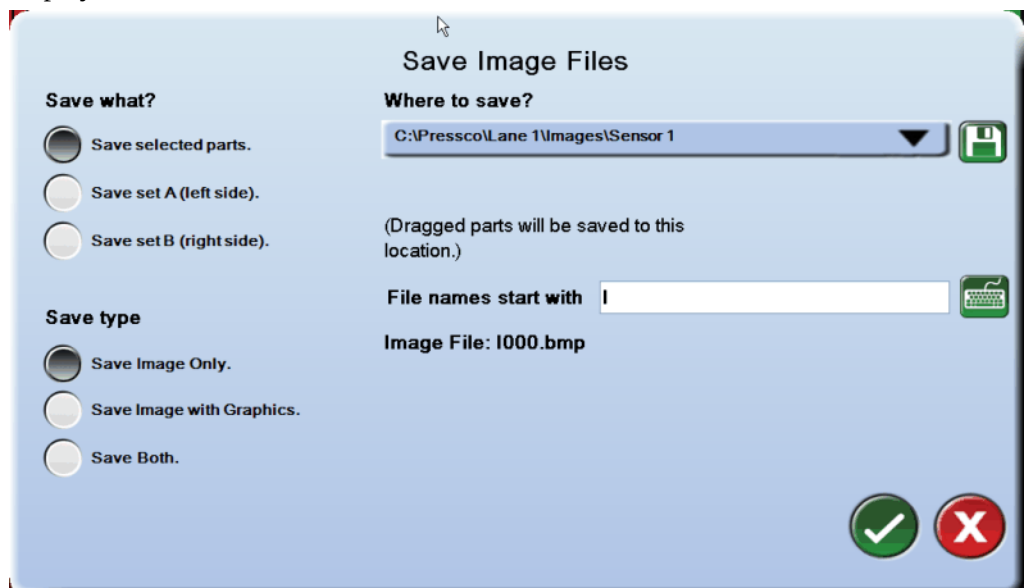


6. Select an option for Data Set A and/or Data Set B (from **Select Data Set A** and **Select Data Set B**).
7. In the Retro-Spec graph, click the bar corresponding to the image you want to save.

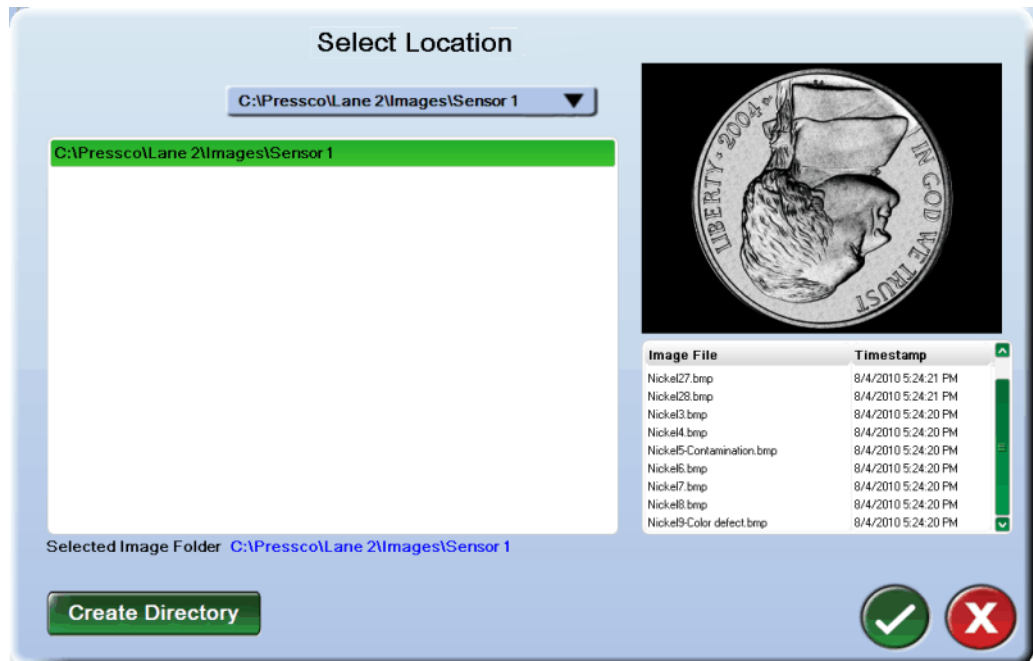


Note: You can save a whole data set from the Save Image Files menu.

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, to your images.



13. Click the OK button  twice to save the image(s).

*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 169).*

14. To save subsequent single images to the same location, click the bar for another part and then click the disk icon on the graph. The part image will be saved.

You can **load** (see "**Loading Images**" on page 177) 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 the Lock/Move Parts button in the **Retro-Spec Population View Graph** (on page 200).*

Recommendations for Image File Management

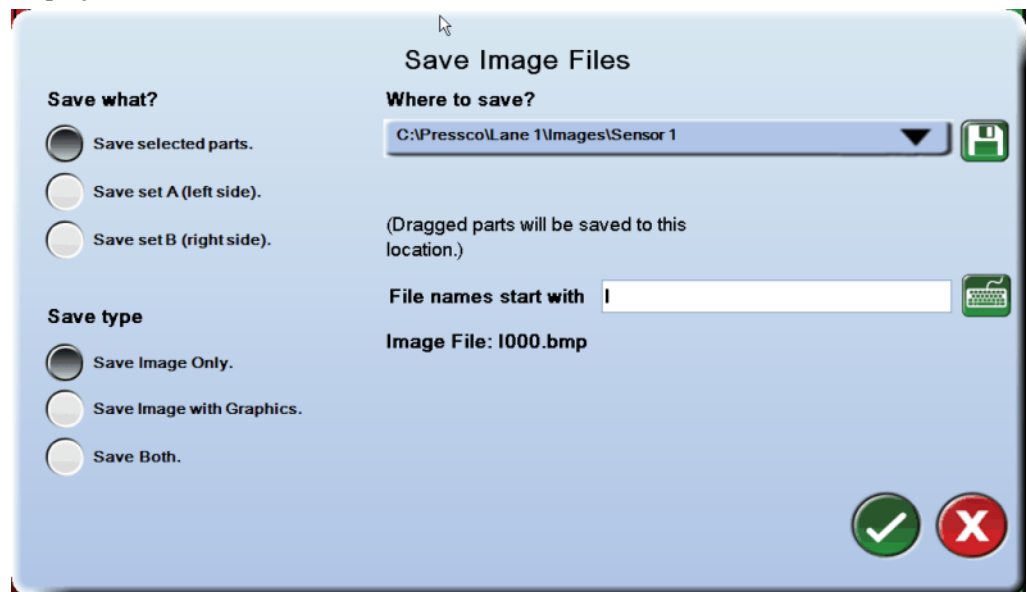
When you save the images for data sets to a folder, each image is given a unique name. However, if you save another data set to the same folder, those original images are overwritten. Therefore we recommend that you create new folders when you save data sets. Our recommendations are:

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

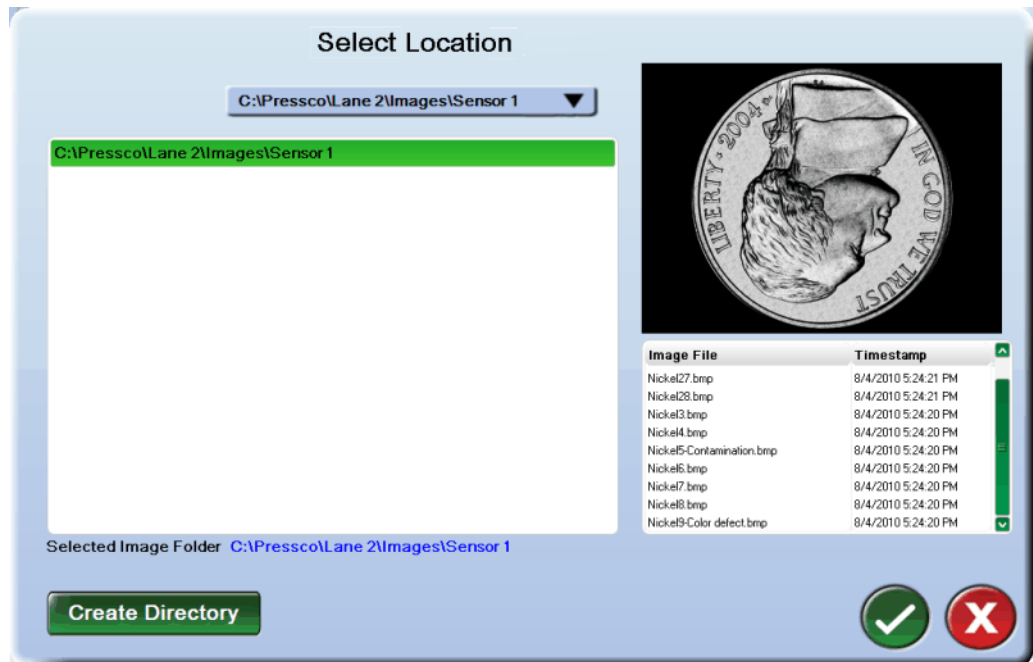
When you are **saving images** (see "**Saving Images through the Retro-Spec interface**" on page 166), you can create new folders (directories).

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.



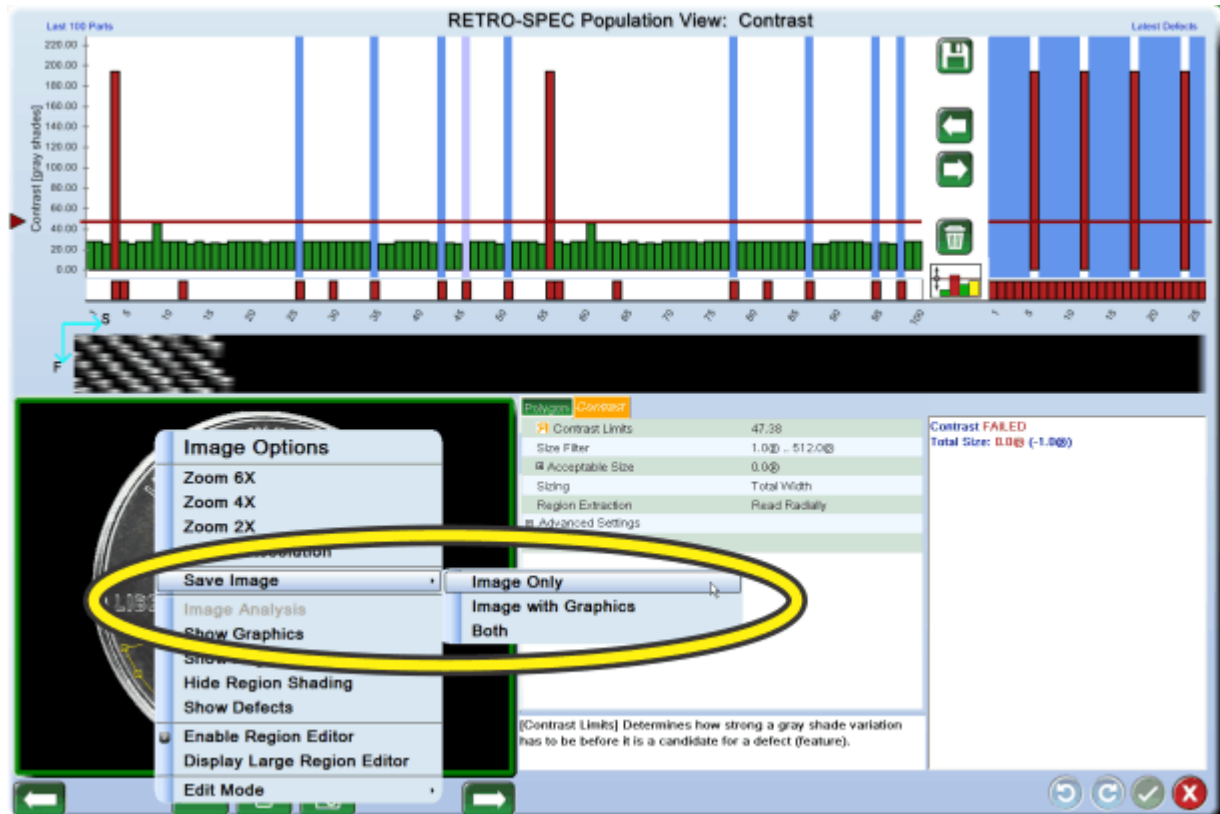
2. Click the disk icon  to browse folders. The Select Location menu is displayed.



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.

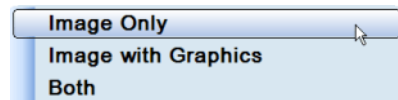


Image Only

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

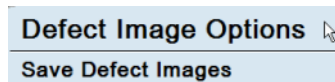
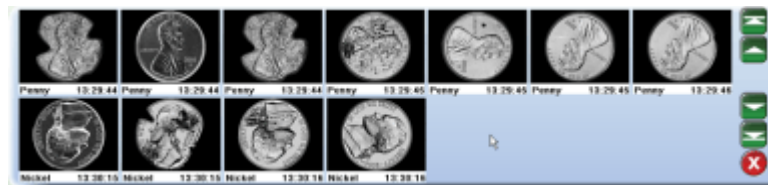
You can save images from parts that were considered defective, either from **Lane Overview** or **Sensor Overview** mode. This can be done when the **Reject Images** button on the right side of the screen is selected. Up to 100 images can be saved at a time. These images can be loaded at a later time 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.

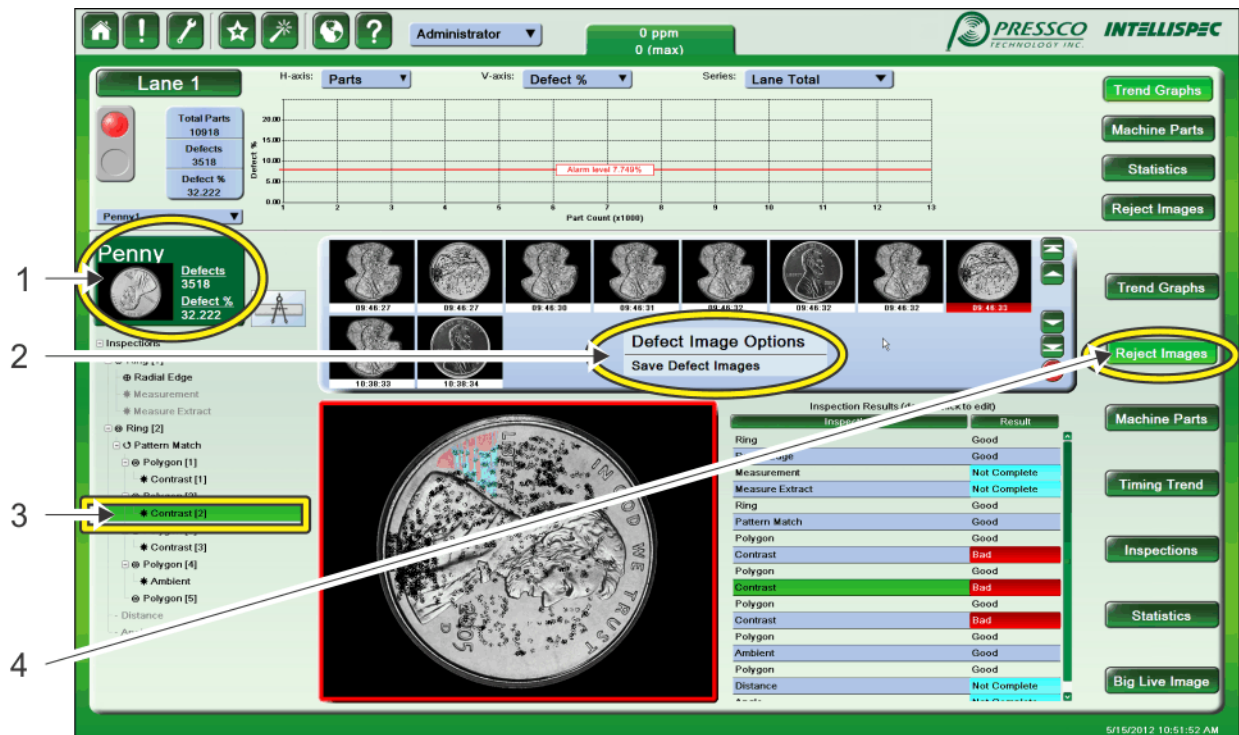
Saving Reject Images by Inspection

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:

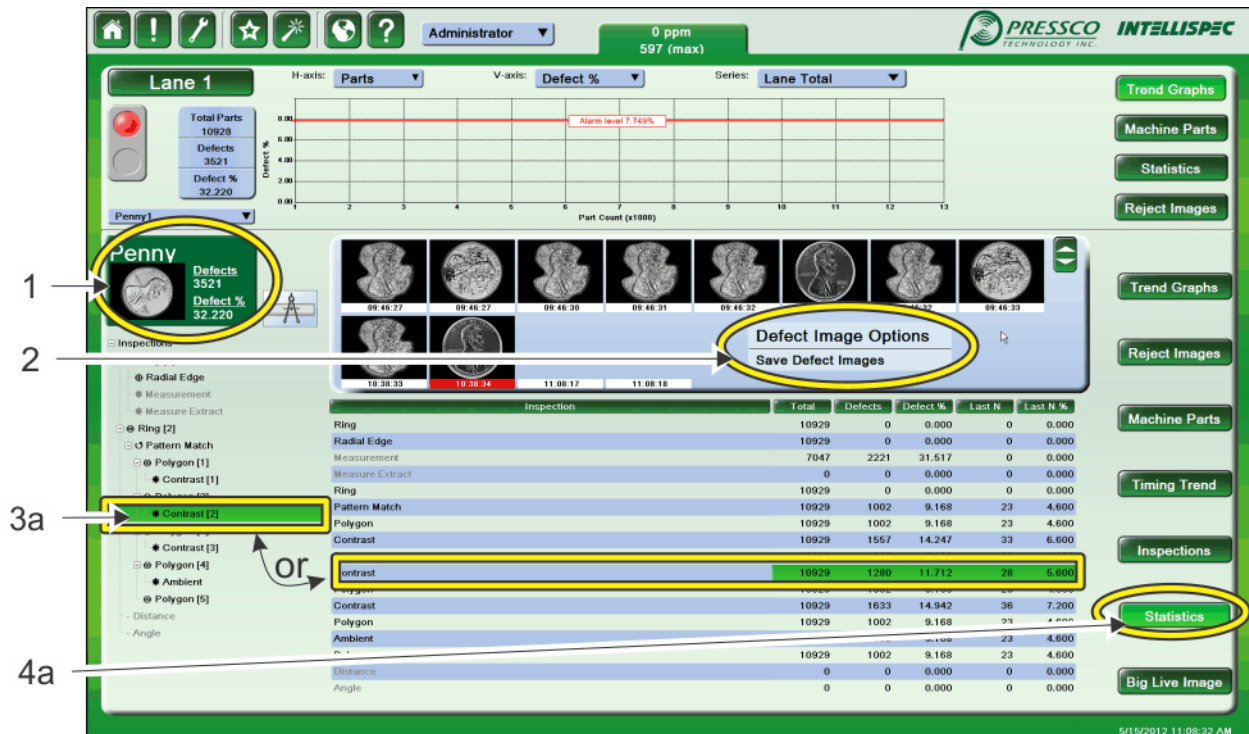
1. Click the name of an inspection [item 3] in the inspection tree. The images associated with that inspection are displayed in the thumbnail image area.
2. Right-click over the set of images to see the Defect Image Options menu [item 2].
3. Select Save Defect Images from the menu. The Save Image menu 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

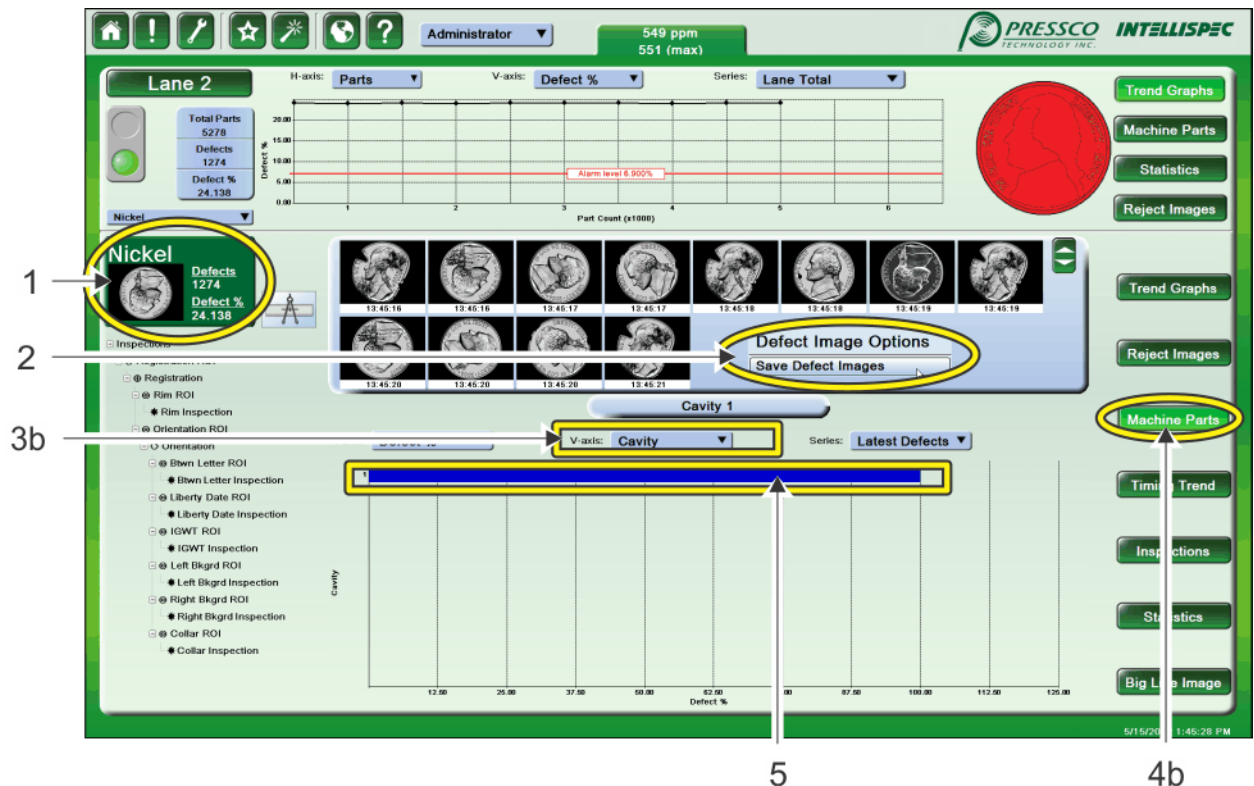
Saving Reject Images by Machine Part

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.
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.
7. 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.



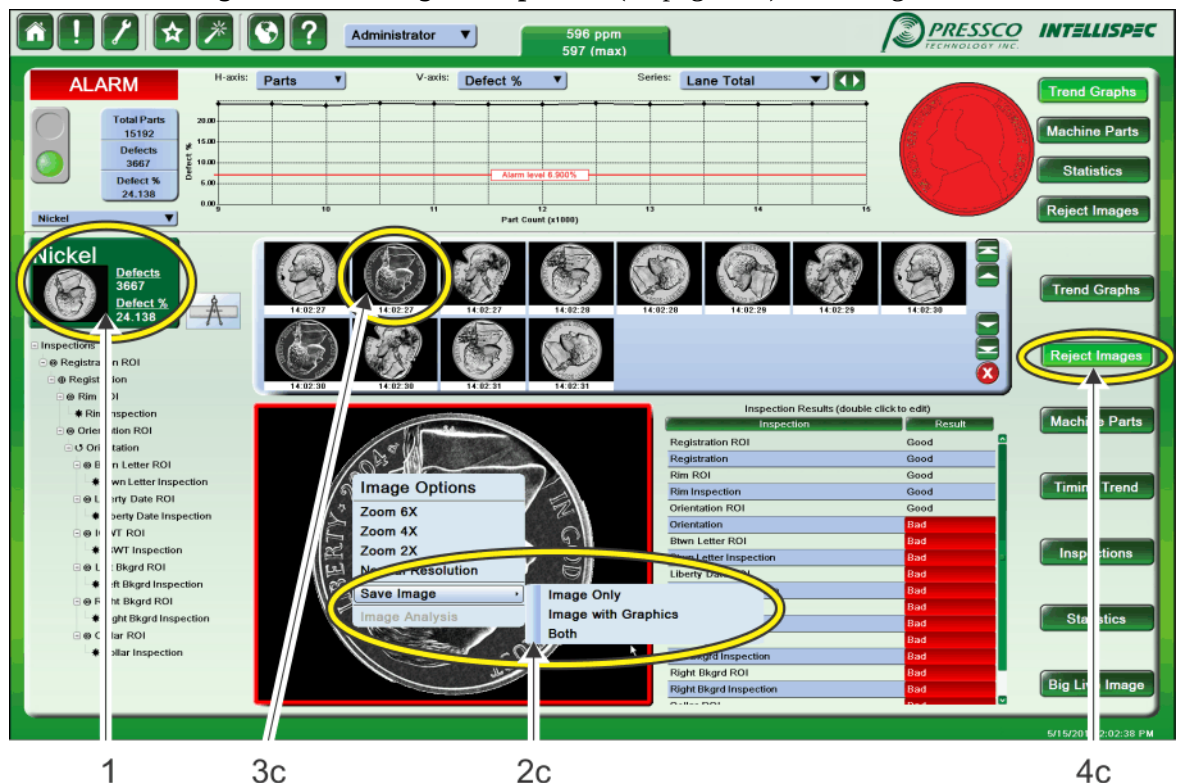
1	Sensor button
2	Right-click over image thumbnails to see Defect Image Options menu
3b	Select a machine part type
4b	Select the Machine Parts button to view thumbnails of defective parts associated with specific machine parts
5	Select a specific machine part from the graph

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):

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 any thumbnail image [item 3c] (available when Reject Images or Statistics button is selected). The Reject Images button becomes selected after you select the thumbnail image.
3. 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 171). 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.

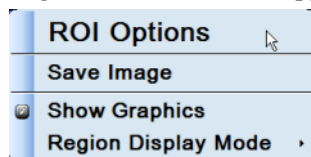
The image can be saved whether the lane is online or offline.



❖ *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.



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 IMAGES

This topic covers how to load images through the Retro-Spec interface. You can also choose an **Image Source** (on page 158) through the Sensor menu.

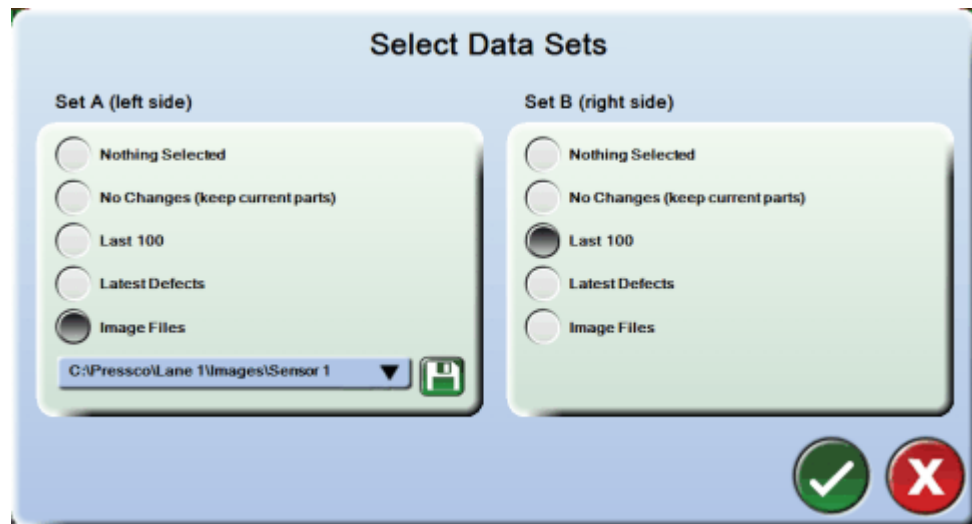
You can load images previously **saved** (see "**Saving Images through the Retro-Spec interface**" on page 166) on the Intellispec to use as reference, test part sets, or to set up a part program without the production line running. You must have user access to edit part programs.

To load images:

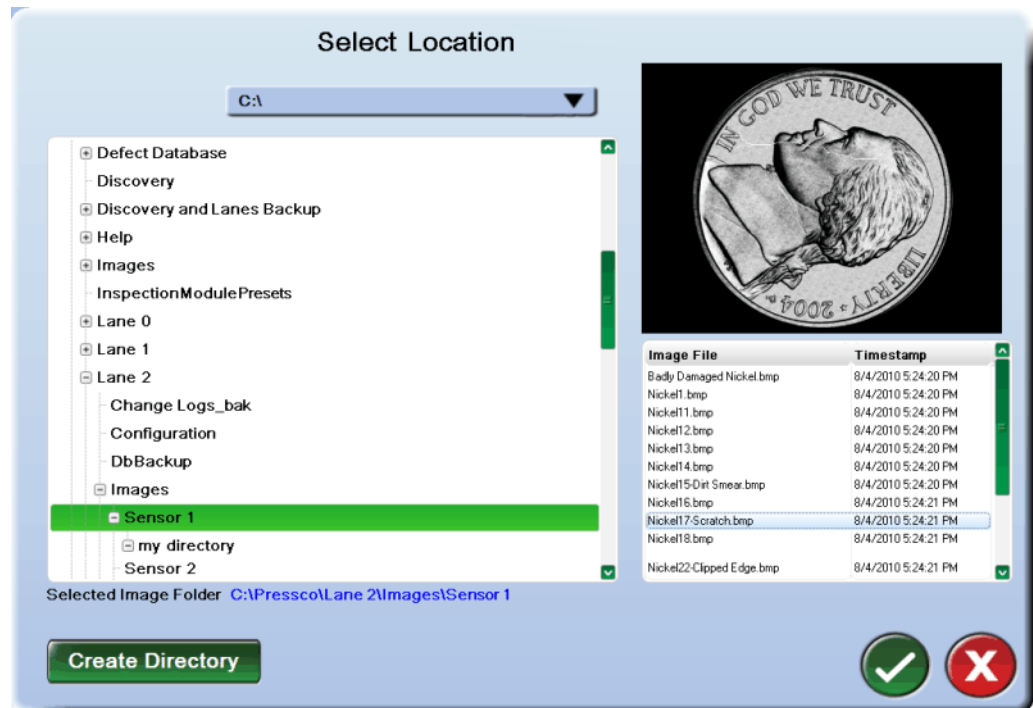
1. Go to Sensor Overview mode [from Home, click Lane button, then Sensor button].
2. Double-click the name of any Registration, Orientation, or Analysis in the inspection tree to view the Retro-Spec interface graph. A partial graph is shown below.



3. Click one of the left or right arrow buttons  to view the **Select Data Sets** menu.



4. Click the Image Files button for either Set A or Set B.
5. Click the disk icon  to browse to the folder where the images were saved. The **Select Location** menu is displayed.

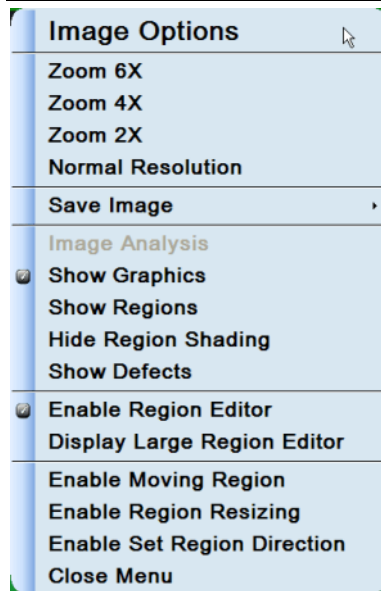


6. Browse to and select the folder that contains the images you want to load.
- To preview the images in the folder, browse through the file names in the window on the right of the Select Location menu.
7. Click the OK button  twice. The Intellispec loads all the bitmap images that were previously saved in the selected folder.

IMAGE OPTIONS

While viewing 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.*



There are options for certain regions. Options are grayed out if they do not apply to the current inspection.

Zoom - 6X, 4X, 2X

Magnify the image by the specified amount.

Normal Resolution

Returns the image to normal size.

Save Image

Save an individual image. Refer to ***Saving Individual Images While Editing an Inspection*** (on page 171).

Image Analysis

Not available from this menu as of this printing.

Image Analysis (on page 150)

Show Graphics

Displays the region and graphics for the current inspection.

Show Regions

Displays the region(s) from other inspections in the same part program.

Hide Region Shading

Removes the shaded graphics from the screen so that you can see more of the part image.

Show Defects

Not available from this menu as of this printing.

Enable Region Editor

Allows you to change the shape and placement of the region directly on the image.

Display Large Region Editor

Displays 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 this option to return the image to normal size.

Enable Moving Center

[Available when you are editing a region] Allows you to change the center of the region when you are using Region Editor directly on the image.

Enable Region Resizing

Allows you to 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

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 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 - moves one point in the polygon. 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 polygon, click anywhere on the image except on one of the yellow polygon points. Click and drag the polygon to move it.

Enable Rotate Around Center - [only available when Move is enabled] Rotate the entire polygon with respect to the center. To rotate the polygon, click anywhere on the image except on one of the yellow polygon points. Click and drag the polygon to rotate it.



Chapter 11

INSPECTION OVERVIEW

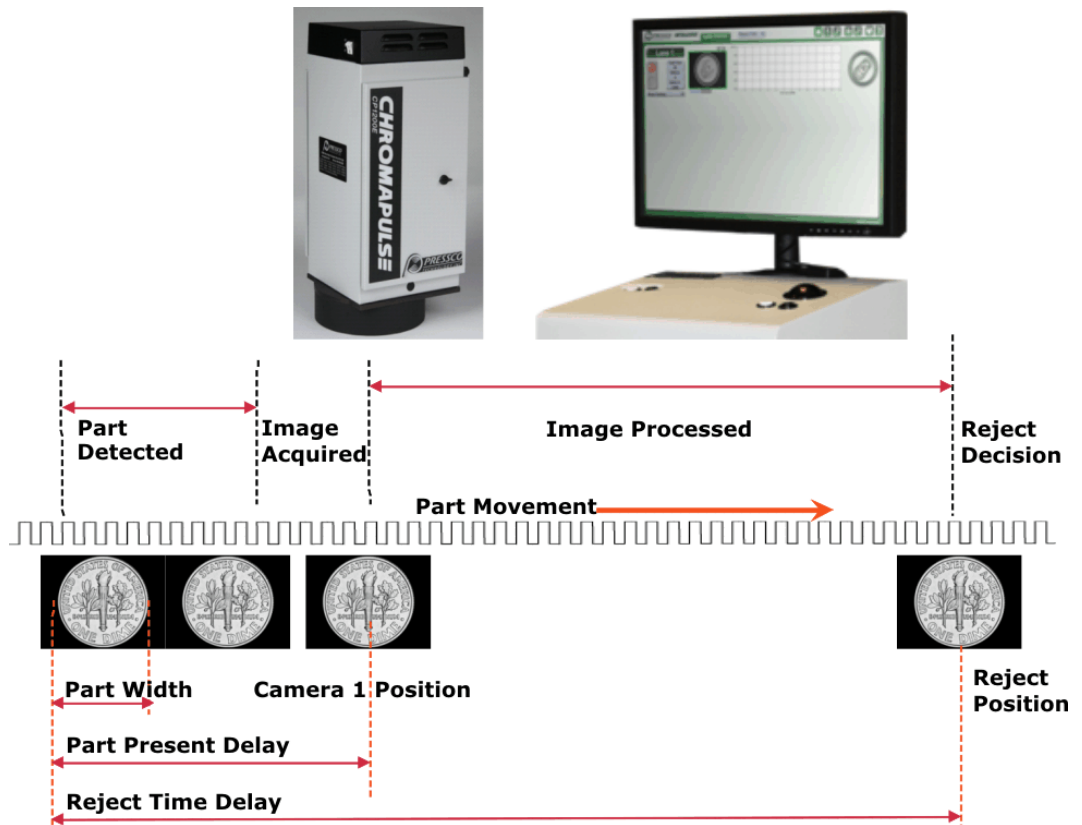
This section includes basic information about part programs, part tracking, and Retro-Spec graphs. For detailed information about adding or adjusting inspections, see the section about **Inspections** (on page 205).

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
Enhancements	Enhancements are used to alter images for the purpose of better defect detection, or for making certain features stand out.
Analyses (on page 233)	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. You may have many analyses for each inspection region.
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 182)	Part Tracking refers to the monitoring of parts from the part detect sensor to reject station. This ensures that the correct parts are rejected at the correct time, and that good parts remain in the part stream.
Region	The Region indicates where on the part the analyses will take place. You may have as many analyses, enhancements, registrations, or orientations as you like in one region.
Registrations (on page 215)	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



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 126)

Reject Delay Calibration (on page 128)

Reject Confirm Calibration (on page 134)

Part Width Calibration (on page 108)

HOW TO CREATE, COPY, OR IMPORT A PART PROGRAM

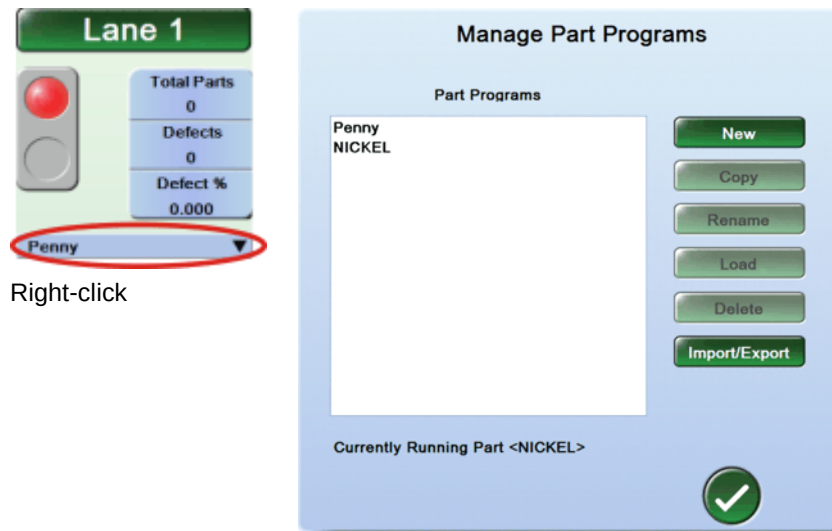
A new Part Program can be created from scratch, imported or exported to/from disk, or copied from an existing part program. A Part Program is created in the Lane Overview or Sensor Overview screen.

You will need:

- User access to create part programs.
- The **mechanical keyboard (MKB)** (on page 32) to enter program names.

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. The Create Part Program Wizard is opened.
2. Follow the steps on the screen.
3. After step two of the create part wizard, click the OK button  to save the new part program. The blank part program is created.
4. Add Regions, Registrations, Orientations, or Analyses as appropriate for your part.

To copy a program:

First click on a name from the available list of part programs, then click the **Copy** button. A copy of that part program is saved under a default name such as "(1) Penny." You can use this copy of the part program to modify it to inspect a slightly different part, or modify the copied part program without changing the original program.

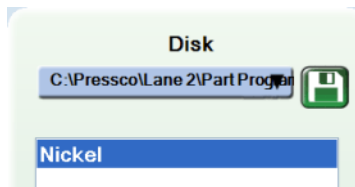
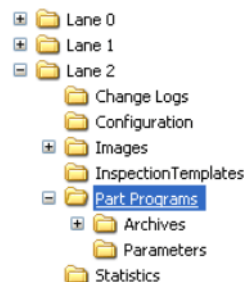
Use the **Rename** button to rename the program to something more meaningful to you.

To import an existing program:

1. Click the Import/Export button. An "Import or Export Part Programs" menu allows you to choose a part program from disk.



2. To browse to another location on the computer, click the disk icon .
3. 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.



4. To import the part program, highlight the name in the right side of the menu under "Disk."
5. Click the left arrow. The part program is imported into the "Current Part Programs" list.
6. 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 116)

PART CHANGEOVER

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

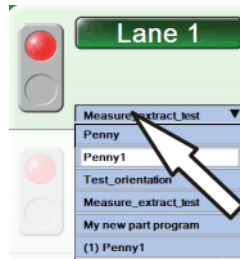
❖ *Note: Some menu items are only available to advanced level users.*

What you need:

- User permission to "Switch Part Program"

To change parts:

1. **Log in** (see "**Logging in and logging out**" on page 45).
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.

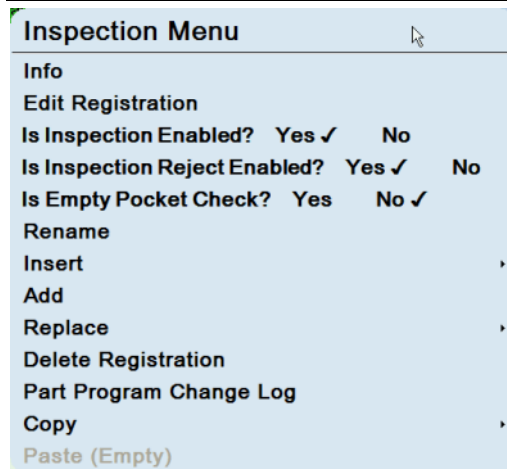
Lane-specific information is contained in each Part Program. Everything you set up have previously set up is stored: camera information, lighting information, calibration information, regions, enhancements, and analyses.

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, Measurements	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 188)

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 even 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 116).

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.

Part Program Change Log

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

Part Program Change Log								Roll Back	
Inspection	Undefined		Show Other Inspections					Difference	
Part Program	Measurement_test		Show Other Part Programs					Details	
Sensor	Undefined		Show Other Sensors					Filter	
Type	Time Stamp	User	Camera/Sensor	Inspection	Parameter	Before	After		
Create	2011-02-15 18:12:07	Administrator	Nickel	Ring					
Edit	2011-02-15 18:12:19	Administrator	Nickel	Ring	Inner Radius	25	199		
Edit	2011-02-15 18:12:49	Administrator	Nickel	Ring	Thickness	50	53		
Create	2011-02-15 18:12:57	Administrator	Nickel	Radial Edge					
Edit	2011-02-15 18:13:36	Administrator	Nickel	Radial Edge	Target Size	100	230		
Edit	2011-02-15 18:13:36	Administrator	Nickel	Radial Edge	Qualifying Percent Limits	E:25.0 W:50.0 G:	E:32.71 W:47.31 G:		
Create	2011-02-15 18:13:56	Administrator	Nickel	Measurement					
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Feature Type	Light Feature	Borders: Both Light		
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Inner Diameter Enabled	No	Yes		
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Enabled	No	Yes		
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Units	pixel	Custom unit		
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Nominal Value	53.0	26.5		
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Min/Max	E:-50.0 W:W-10.0 G:[55555.0] G:0.0 W:W:0.0 E:	E:-25.42 W:W-25.17 G:[26.5] G:0.0 W:W:0.77 E:		
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Average	E:-50.0 W:W-10.0 G:[55555.0] G:0.0 W:W:0.0 E:	E:-26.5 W:W-26.5 G:[26.5] G:0.0 W:W:0.0 E:		
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Continuity	E:-50.0 W:W-10.0 G:G:10.0 W:W:50.0 E:	E:-40.76 W:W-8.85 G:G:3.63 W:W:4.62 E:		
Edit	2011-02-15 17:17:21	Administrator	Nickel	Measurement	Width Range	G:53.0 E:	G:11.65 E:		
Create	2011-03-01 18:03:37	Administrator	Nickel	Clipping					
Edit	2011-03-01 18:05:17	Administrator	Nickel	Clipping	Use Clipping	No	Yes		
Create	2011-03-01 18:05:26	Administrator	Nickel	Stretch Grayshades					

To view the part change log:



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

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

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

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 11:18:00	Tricia

Inspection Name: Pattern Match

Parameter Name: Inspection Disabled

Before: True

After: False

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).



Type	Time Stamp	User	Camera/Sensor
Create	2010-04-16 10:43:18	Tricia	Rivet
Create	2010-04-16 10:43:31	Tricia	Rivet
Create	2010-04-16 10:43:38	Tricia	Rivet
Create	2010-04-26 15:37:40	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 14:27:16	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 14:28:42	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.
6. 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.

Differences						
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	RingVO	Inspection Disabled	False	True

Details 

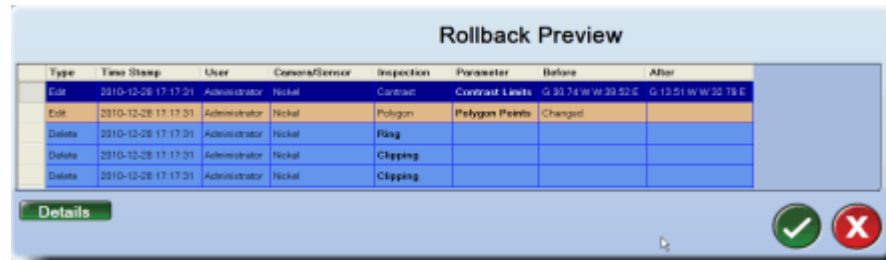
ROLLBACK

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:

1. Check the box next to the Rollback button at the top of the Part Change Log Viewer screen.
2. Scroll down towards the bottom of the inspection list. The latest changes are at the bottom of the list.
3. 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.

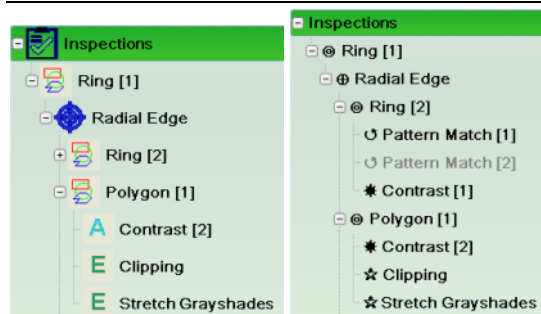


- If desired, click the Details button to see the inspection change details of each line.
- If you are ready to delete the displayed lines, click the OK button . The lines are deleted, and the part program is changed back to a previous state.

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
		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

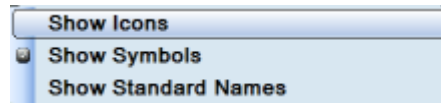
Options (sensor menu)

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.*

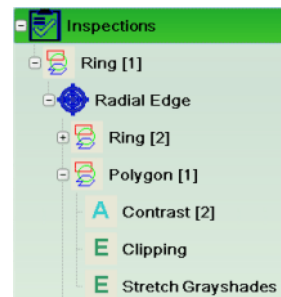
To enable an option:

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.



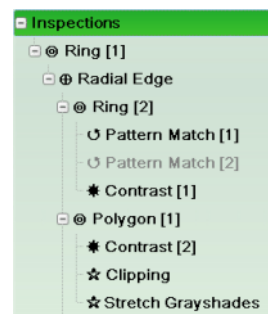
Show Icons

Displays icons that reflect the different *inspection types* (see "*Inspection type icons*" on page 191).



Show Symbols

Displays symbols that reflect the different *inspection types* (see "*Inspection type icons*" on page 191).



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.

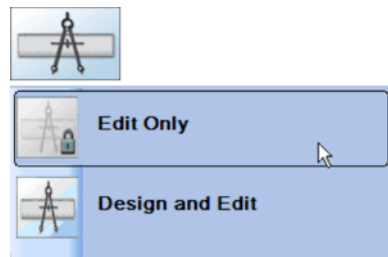
Inspection tree items may be highlighted in different colors. Below is a key.



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 52).*

See also *how to create a part program* (see "*How to Create, Copy, or Import a Part Program*" on page 182)

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.

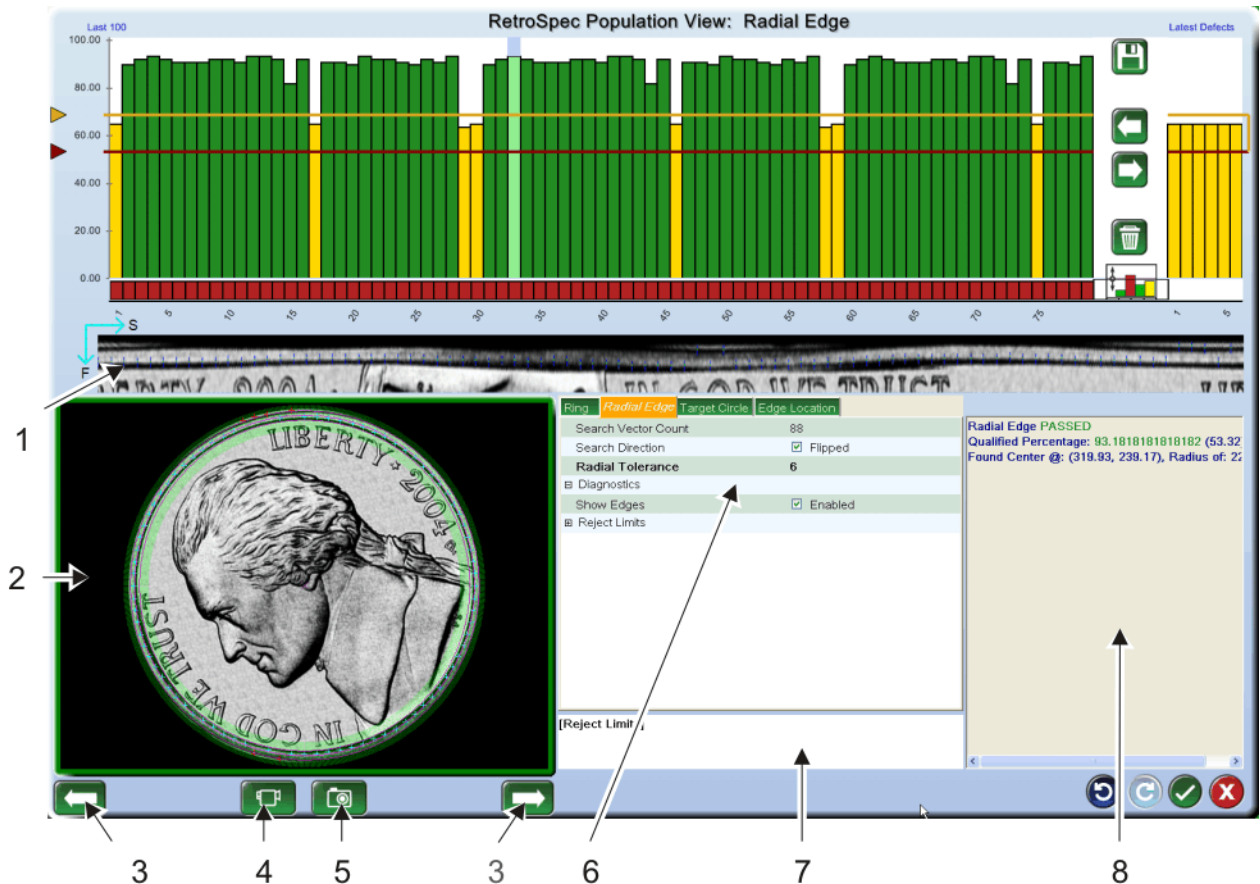


1	Unwrapped Region of Interest	Displays a linear view of the region from the edited inspection.
2	Part Image	Displays a view of the part with the editable region on the part.
3	Editable Region	This is the region on the image that can be edited. When the lines are yellow, they can be edited. To enable 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	Refresh Data Set	Takes up to 100 images with the current sensor and replaces Data Set A.
6	Snap Image	Takes one image with the sensor and adds it to the end of Data Set A.
7	Editable Parameters	Adjust different parameters associated with the current region.
8	Parameter Description Window	Gives a brief description of the selected parameter.
9	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 200) 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	Refresh Data Set	Takes up to 100 images with the current sensor and replaces Data Set A.
5	Snap Image	Takes one image with the sensor and adds it to the end of Data Set A.
6	Inspection Parameters	Displays the available parameters for the selected inspection. Note: there can be multiple tabs; the parameters will vary per inspection.
7	Parameter Description Window	Gives a brief description of the selected parameter.
8	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

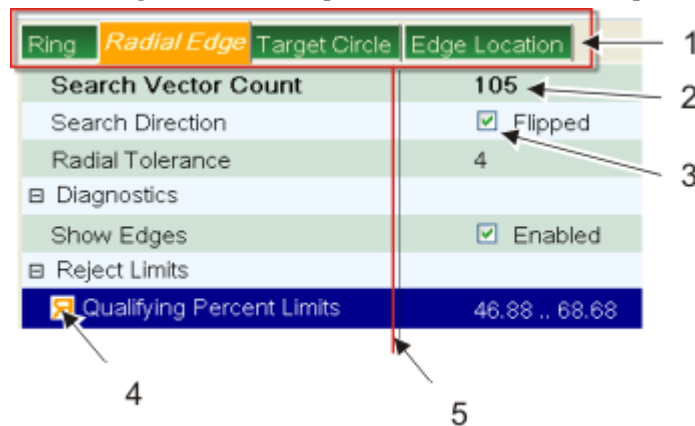
You can change values, display settings, and options that will alter the outcome of an inspection. For the purpose of this discussion, we refer to **inspections**, but the information applies to regions, registrations, orientations, enhancements, measurements, and correlations as well.

❖ *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).

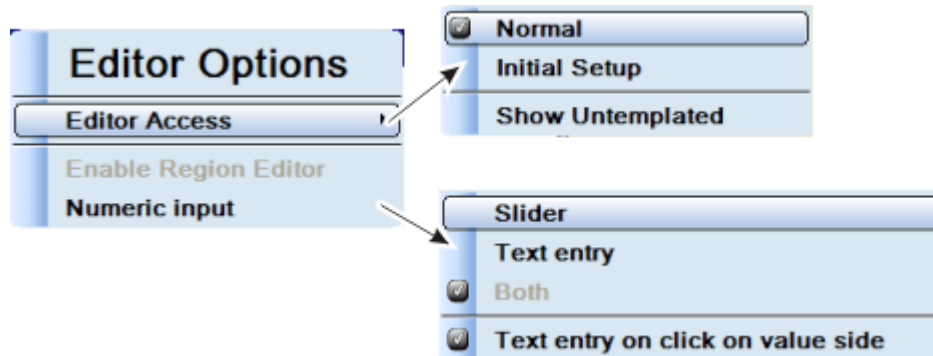
Numeric Text Entry

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 30)

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 parameter names are displayed.

- Normal = the names of the parameters as you normally see them; if you have re-named any parameters to make more sense to you, this is how they are displayed.
- Initial Setup = the names of the parameters when the Intellispec system was installed, after applying the appropriate application template.
- Show Untemplated = default Intellispec names. Some parameter names were changed in templates to make more sense for a particular application.

Enable Region Editor

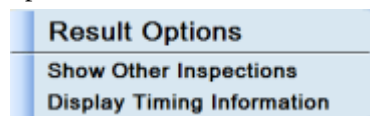
Available when the inspection has an associated region that can be modified.

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.



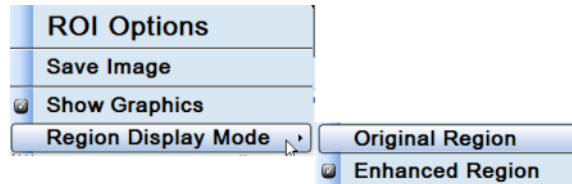
Inspection	Result
Ring	Good
Radial Edge	Good
Measurement	Not Com...
Measure Extract	Not Com...
Ring	Good
Pattern Match	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Contrast	Bad
Polygon	Bad
Ambient	Bad

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 177)

Save the Region of Interest image.

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.

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

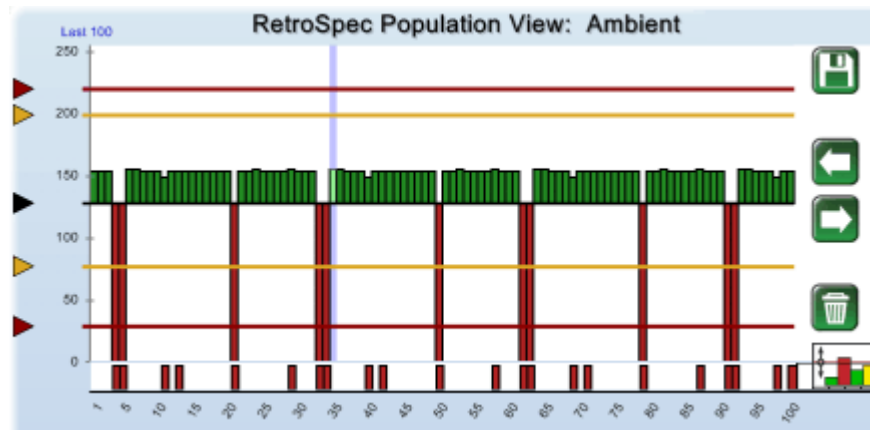
Displays details for up to the last 200 parts. The parts can be the last 100 run, the latest 100 defects for the inspection, or a set of parts previously saved to the hard drive.

Graphs with One Reject Bar

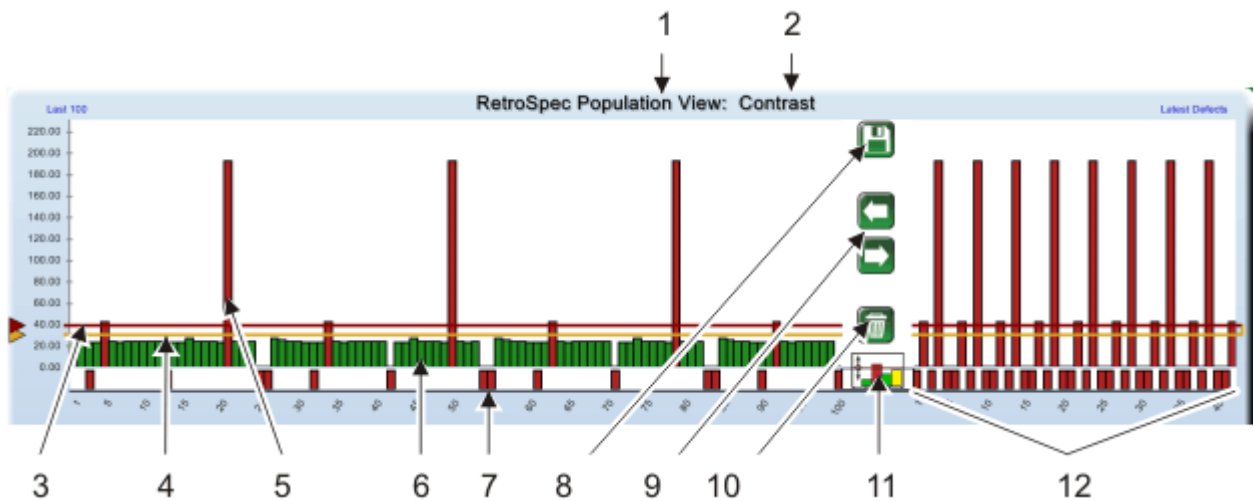
Some inspections have one reject bar on the Retro-Spec Graph. The Warning/Reject Bar can be a minimum requirement where the part Retro-Spec value must be higher than the reject bar in order to pass. The Warning/Reject Bar can also be a maximum requirement where the part Retro-spec value cannot exceed 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?"

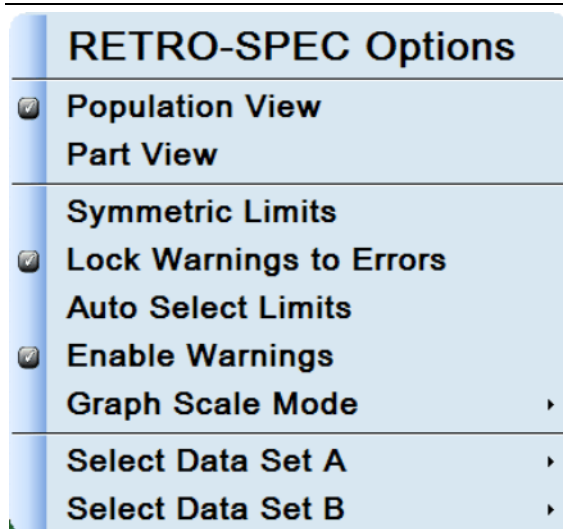
9	Select Parts	Allows you to select a set of parts, set A or Set B, to be displayed in the Retro-spec Graph. Clicking on either the left or right arrow will bring up the Select Parts Menu below. You can choose from Last 100, Latest Defects, or Custom Set.
10	Delete Part [Trash can icon]	Gives you the 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 200) is displayed.

Part View

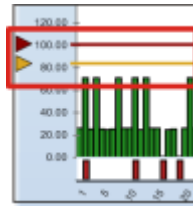
When this is checked, the Retro-Spec part view graph is displayed.

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.

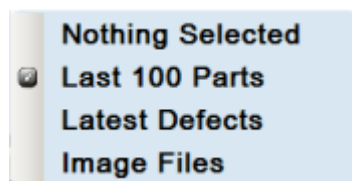
Limits Only displays part parameter values up to and including the current inspection limits. This is useful when you want to zoom in on data without extra lines on the graph. Note that the limit lines may not be displayed on the graph. As soon as you change the parameter limits from the menu, the limit 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

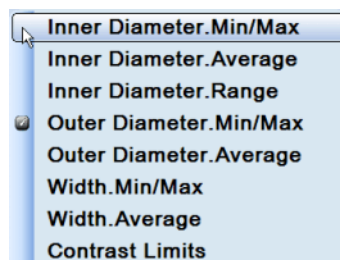
For each Data Set, you can select what you want to display. You can choose to display Nothing, Last 100 Parts, Latest Defects or a set of Image Files that have been previously saved to the computer.

See information about *Saving Images* (see "*Saving Images through the Retro-Spec interface*" on page 166).



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.

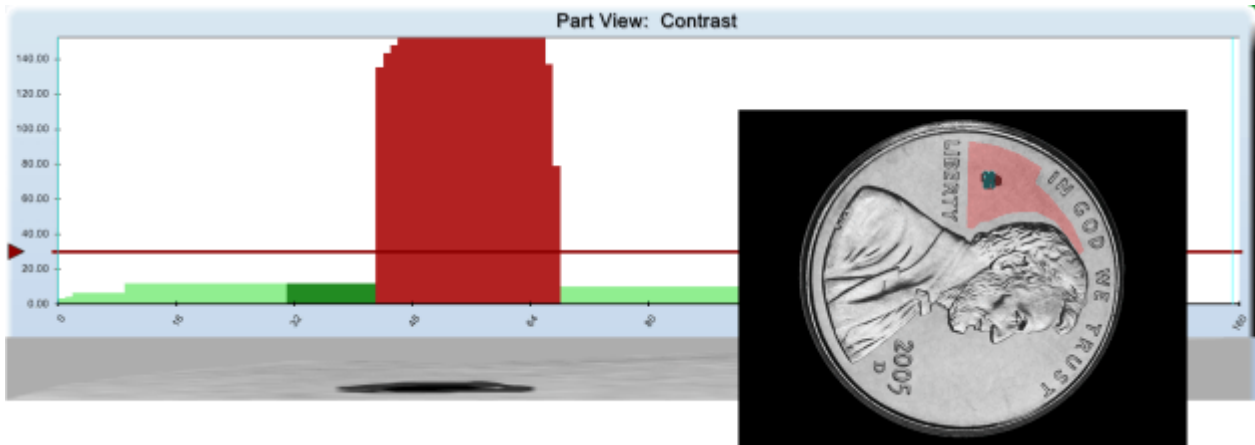


RETRO-SPEC PART VIEW GRAPH

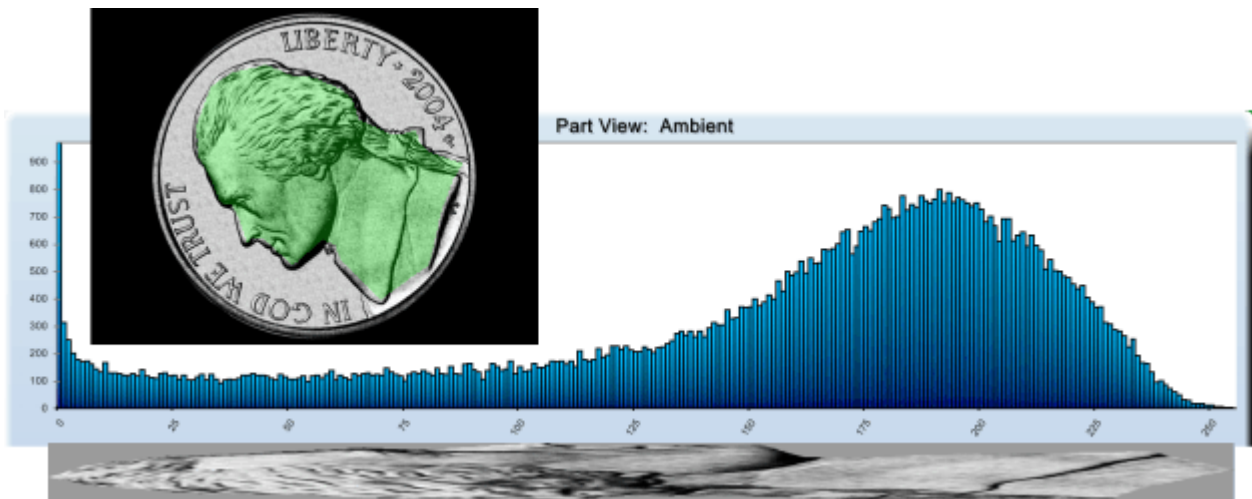
The Part View shows specific information unique to each part. To display the Part View, right click on a part and choose Population View, or double-click a part from the Population View. There are different types of Part Views that vary by inspection.

❖ *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 12

INSPECTIONS

This section covers regions of interest, registrations, orientations, enhancements, analyses, and measurements. We use the term 'inspections' to include all of these items, for simplicity.

The information in this section is valid as of software version 5.1.021.

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 208)

Ribbon Region (on page 210)

Measure ROI (on page 213)

Finish Location (on page 221)

Support Ring Registration (on page 226)

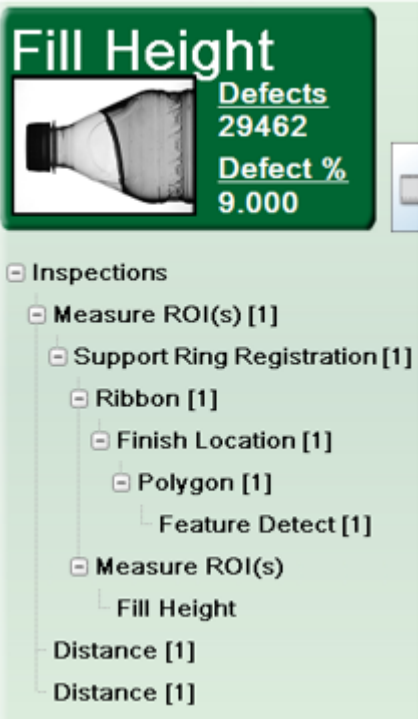
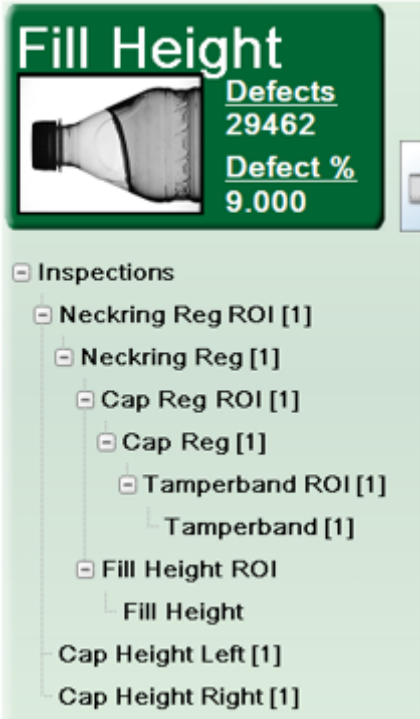
Fill Height (on page 234)

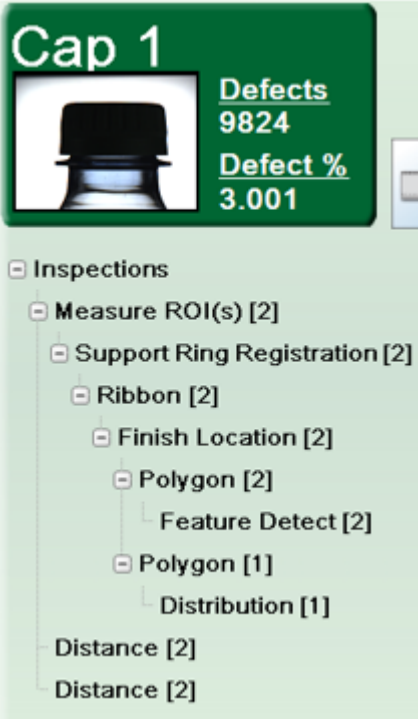
Distribution (on page 242)

Feature Detect (on page 247)

Distance (on page 250)

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
	

FILL HEIGHT/ CAP PLACEMENT INSPECTION OVERVIEW

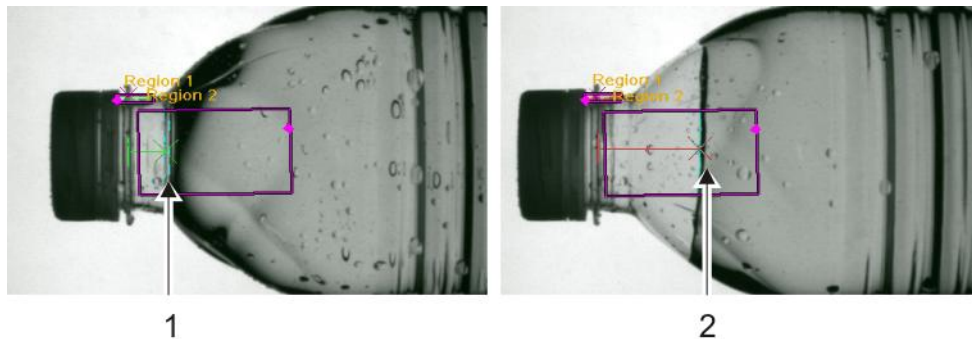
The Intellispec software, combined with the FHCP 3X inspection module, performs inspection with the following specifications:

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 ($H0 + 1 \text{ mm}$)
- Cocked cap ($H0 + 1 \text{ mm}$)
- 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, analyses, and orientations 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 up to five 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.*

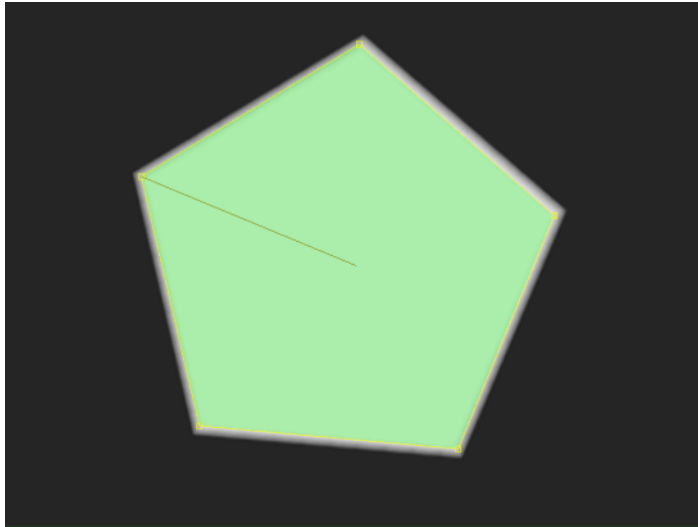
- Ring Region
- **Polygon Region** (on page 208)
- **Ribbon Region** (on page 210)
- **Measure ROI** (on page 213)
- Adaptive Region

Polygon Region

Similar to the **Ribbon Region** (on page 210), 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

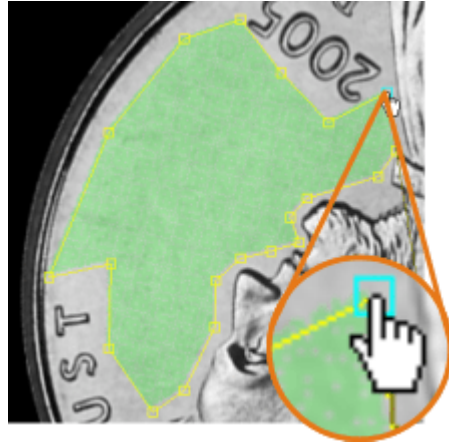
❖ *Note: we recommend that you place a Registration and Orientation (if applicable) prior to adding a polygon region. This will ensure that the polygon is placed correctly on the part, regardless of the part's placement or rotation.*



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 in the inspection tree to see the Inspection menu.
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.

- When you want to close the region, click on the first box that you placed. The region closes and is filled in for you.



- 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 179) 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.

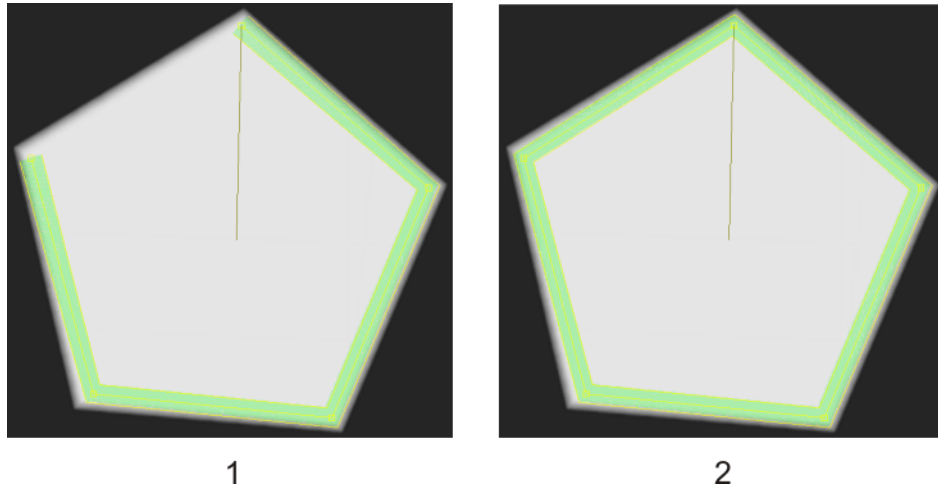
Note: be careful not to contract the region too much. This will distort the original shape.

Ribbon Region

Similar to the **Polygon Region** (on page 208), 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	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 in the inspection tree to see the Inspection menu.
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 179) 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 or 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** (on page 216) 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.

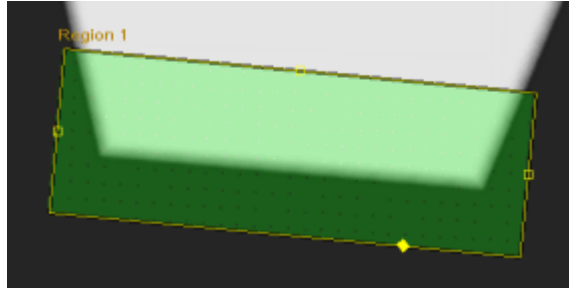
Expand or Contract

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** (on page 234), and **Support Ring Registration** (on page 226)).



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 in the inspection tree to see the Inspection menu.
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.

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.

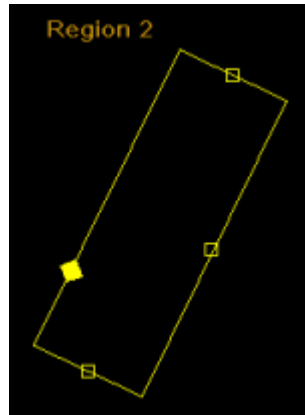
Center Offset X and Y

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

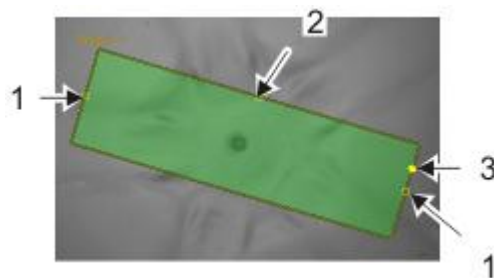
Adjust the size and rotation of the region. You can also click on the image and adjust the region graphically (if Enable Region Editor is checked in the Image Options menu). To adjust, click and drag one of the empty yellow squares.

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

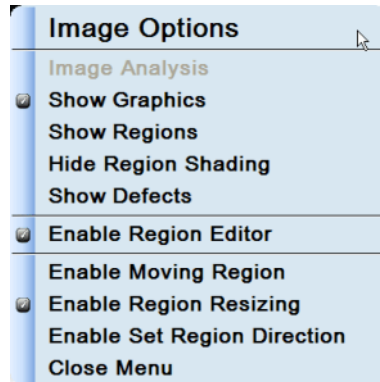
ADDITIONAL MENU ITEMS FOR TWO REGIONS

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.

IMAGE OPTIONS MEASURE ROI

When you right-click the image you will see a slightly different image options menu for Measure ROI. Most of the menu items are the same as in the default **image options** (on page 179) 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.

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 208) where you want the Registration to take place.*

Available registrations include:

- Feature
- Center of Mass
- Hough
- Radial Edge
- **Centerline** (on page 216)
- **Finish Location** (on page 221)
- Template Registration
- **Support Ring Registration** (on page 226)

❖ *Note: Your system (and this book) may show only those items that apply to your application.*

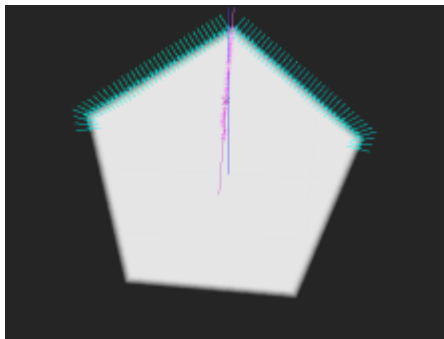
Centerline

Centerline Registration finds the sides of a container and determines the center line between them. It also computes an orientation of the container. This registration uses the mirrored polygon ribbon region. With Centerline registration, you can determine the orientation of a feature and compare it to the orientation of the entire part. You can also check the slope of the sides of the container, or check the overall shape of the container.

FHCP applications: Centerline is used in place of Support Ring Registration in cases where bottles have caps that cover the support ring. In these cases, the system cannot register on the support ring, so a refined centerline is used instead. Centerline also tracks the vertical position of the part in version 5.1.021 and higher.

Series IV users: this replaces Midline Orientation, and is similar to Shape Adapt Registration.

- ❖ *Note: this registration requires a **Ribbon Region** (on page 210) using settings: Ribbon Style = Ribbon, and Mirror Ribbon = Enabled.*
- ❖ *Tip: you can use Centerline to determine Registration plus Orientation, or just Orientation.*



To add a Centerline Registration:

1. Place a **Ribbon Region** (on page 210), using a mirrored ribbon.

2. Right-click in the inspection tree to see the Inspection menu.
3. From the Inspection menu, select Add > Registration > Centerline. The Centerline registration is added to the inspection tree. Re-name it to something more meaningful to you.
4. The Centerline 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.

Centerline menu

Ribbon	Centerline	Search Settings	Enhance Center	
Applied Results		Center and Orientation		
Setup Mode		Common Setup		
Search Vector Count		36		
Refine Centerline		☒ Enabled		
Max Iterations		2		
Region Extraction		Read Radially		
☐ Diagnostics				
☒ Shape Check				
☒ Shape Limits		0.0° +360.0° / -360.0°		
Shape Sensitivity		90		
☐ Area Check				
☐ Angle Check				

Applied Results

This determines whether the found center and/or orientation are reported to inspections that follow the Centerline. Use Center and Orientation to report both to following inspections. Use Orientation to report only the orientation, but use a previously found center.

Setup Mode

Use the same parameters to find both sides of the container (Common Setup), or set up the parameters differently for each side of the container (Individual Setup).

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.

Refine Centerline

This re-computes the centerline. It allows the inspection to get a better alignment of the two sides to produce a more accurate centerline angle. Note that this adds inspection time. Set the number of times this is performed through **Max Iterations**.

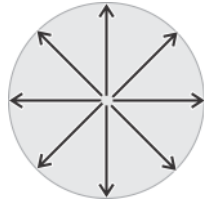
Max Iterations

Set the number of times the inspection will re-compute the centerline angle. Note that the more iterations you use, the more inspection time is used. The edges are displayed as follows:

Number of Iterations	Color of edges displayed
1	Cyan
2	Magenta
3	Dark Blue
4	Dark Gray
5	Yellow

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.



DIAGNOSTICS

Show Vectors

Show the search lines on the image.

Show Edges

Show the found edges on the image.

Show Alignment

Display the alignment of the current part with respect to the previous alignment.

SHAPE CHECK

Check the angle of the sides of the container.

Shape Limits

Set the angle limits for the container.

Nominal

The ideal value for the shape of the container.

Shape Sensitivity

Set the sensitivity for the straightness of the center line. 100 indicates that points must fall on a perfectly straight line (most sensitive). A setting of one indicates that points can fall anywhere (least sensitive). A value of 90 is good sensitivity in most cases.

AREA CHECK

Check the area of the points found. It is good for determining underblown and overblown bottles.

Area Range

Define the acceptable deviation (in pixels) from the normal area of the region. You may also adjust the values on the Retro-Spec graph.

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.

ANGLE CHECK

Check the orientation of a feature against the previous orientation. If an orientation inspection was not added to the part program, zero degrees is used. For example, this could be used to detect turned tabs on a converted end.

Angle Limits

Set the angle tolerance for the feature.

Nominal

The ideal orientation of the feature.

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.

Search Settings menu

Ribbon	Centerline	Search Settings
Vector Direction		Inwards
Edge Polarity		Light-to-Dark
Edge Gradient		15 .. 96
Edge Delta		2
Edge Size		1
Use Subpixel		☐ Enabled

This menu specifies settings for the search vectors.

Vector Direction

Specify which direction the vectors should search, with respect to the center.

Edge Polarity

The type of edge for which you want the system to look – 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 increases inspection sensitivity 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

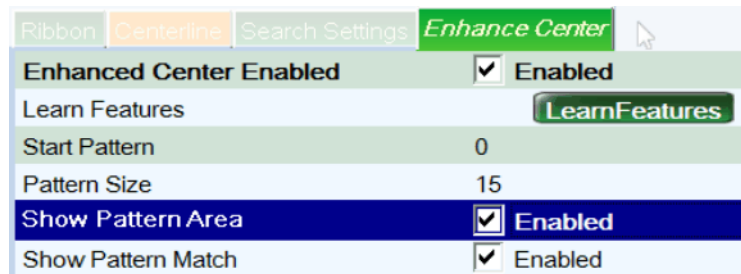
Finds edges based on their subpixel location, rather than rounding off to the nearest pixel. This gives greater centering accuracy.

Enhance Center menu

Use this menu to track the vertical position of the part; not just the side to side angle position. The inspection performs a pattern match, between matching points in the two regions. If it does not find similar features on both sides of the part, then the registration fails.

❖ *Tip: when placing the ribbon region, place it on an area of the part that is unique from other areas of the part. Place the ribbon where the system can see edges across from each other. See the example under Pattern Size below.*

-
- ❖ *This technique works best when the ribbon is set up parallel with the centerline of the part and NOT set up to follow the profile of the sidewall.*
 - ❖ *Note: This feature will only work with a symmetrical part. If the part looks different from side to side as it rotates, then this feature may not work.*
-



Enhanced Center Enabled

Enable the search for the vertical position of the part.

Learn Features

Click the **Learn Features** button to allow the system to learn the features of the part. You will need to **re-learn** the part if you:

- Change the number of search vectors,
- Move or resize the region,
- Adjust the edge search criteria, or
- Change anything that makes the edge positions change.

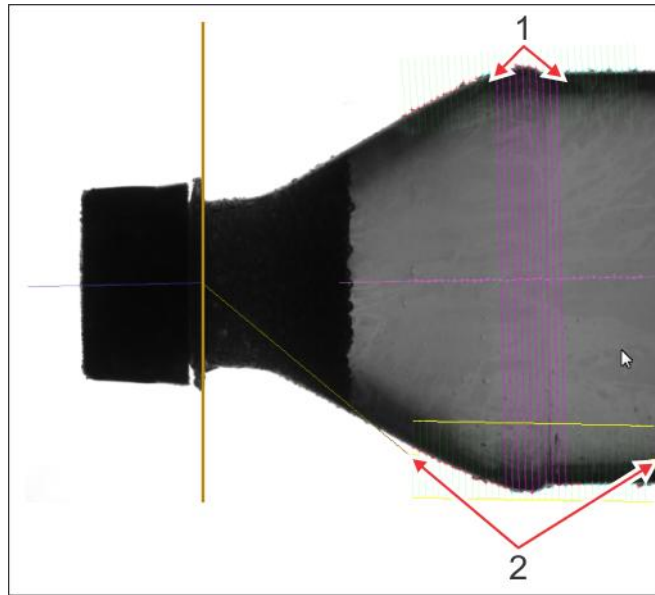
Start Pattern

Specify how many vectors down from the top of the ribbon that the pattern area should start. Check the Show Pattern Area box to view it. Note that if you move your pattern too far towards the bottom of the search region, then the pattern will be clipped. That is, it will have fewer vectors than you specify. If you move it outside of the range of the search region, then the pattern wraps back to the top of the region.

Pattern Size

Specify how large the pattern should be, in search vectors. The pattern should only take a portion of the search area, and should be large enough to accommodate the unique section of the part. In the example below, our pattern area covers just the shoulder area of the bottle.

-
- ❖ *Note: The pattern works best when it is set up to follow a unique pattern, such as the shoulder of this bottle. It will not work well on an area with no width variation. If you have a part with multiple features that are all similar, it is best to include all of the similar features in the pattern.*
-



1	Pattern Area. Pattern Size in this example = 10.
2	Ribbon search region

Show Pattern Area

Show the vectors in the pattern area. The pattern is shown in magenta.

Show Pattern Match

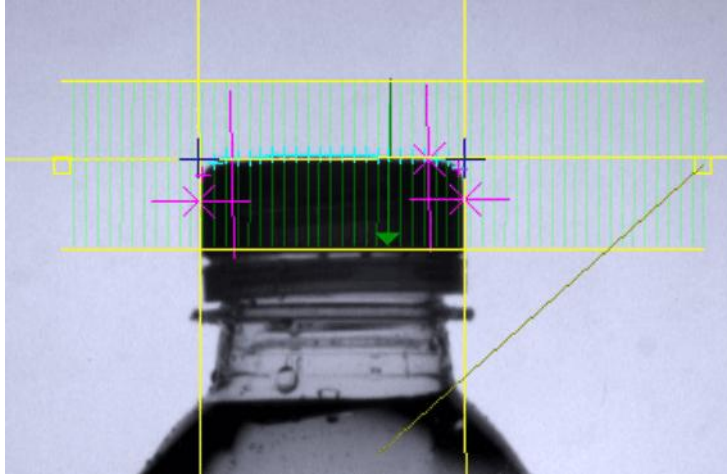
Show the edges that best match the learned pattern. The pattern is shown in dark green. When you also show the pattern area, it will overwrite the pattern area. This shows how much from the original pattern that the part has moved.

A light green line is also displayed at the top of the pattern between search vectors. The line is drawn with a cross on each side and the center position. This center position will be the part placement position.

Finish Location

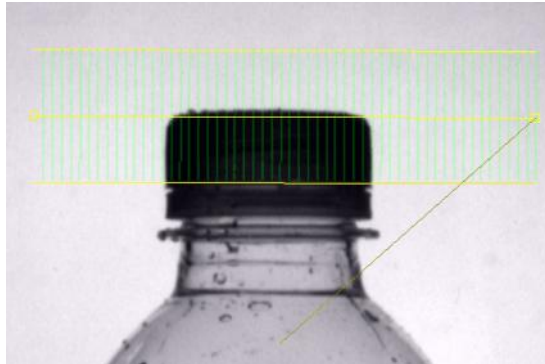
Finish Location is used to locate the top corners of a bottle. It uses a **ribbon region** (on page 210). Finish Location also determines part orientation, and passes on the orientation to subsequent inspections.

Series IV users: Finish Location is similar to Finish Registration in Series IV



To add a Finish Location registration:

1. Make sure a **Ribbon Region** (on page 210) of Interest has been added to the inspection tree. An example of region placement is shown below.



2. Right-click in the inspection tree to see the Inspection menu.
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		Read Radially		

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

If the box is checked, the search changes to the opposite direction.

FINISH SETTINGS

Tilt Limits

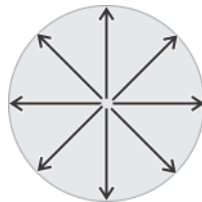
Set the allowed range of tilt of the part within the image.

Nominal

The expected range 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 Polarity

The type of edge for which you want the system to look – 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 increases inspection sensitivity 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.

Corner menu

Adjust these settings to best find the corner on your part.

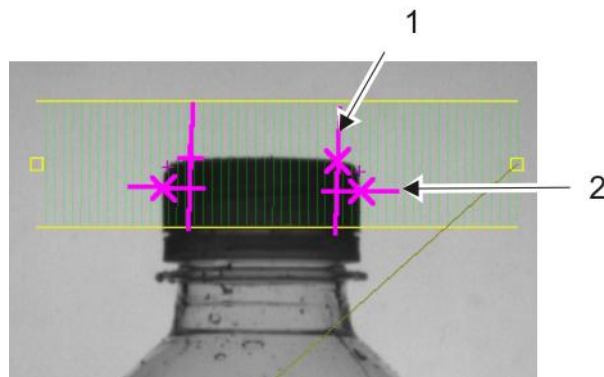
❖ *Note: Enable the **Show Corners** option in the Diagnostics tab to see the position of the vectors.*

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 Location	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 179) menu.

Show Framing

Display the lines that show where the finish is located based on the projected corners.

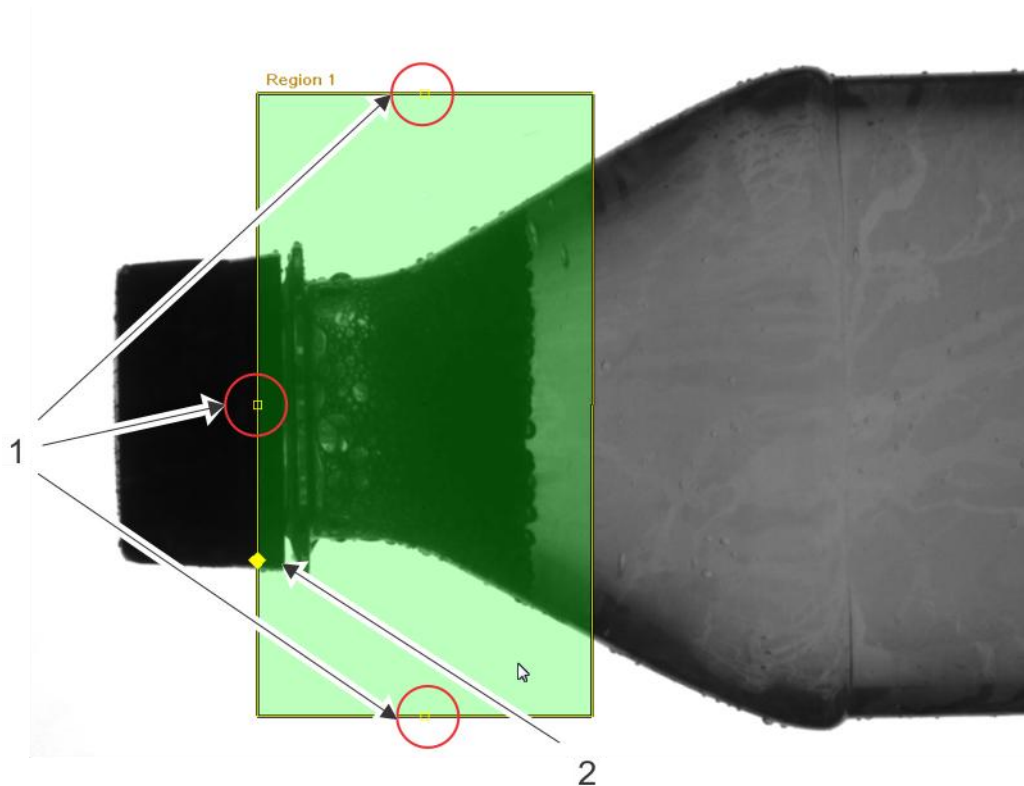
Support Ring Registration

The Support Ring 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 213) Region. The Support Ring registration finds the edges of the neck ring, then it computes the diameter of the neck ring as well as the tilt of the bottle.

❖ *Note: Support Ring Registration requires a **Measure ROI** (on page 213) region.*

Before adding a Support Ring registration:

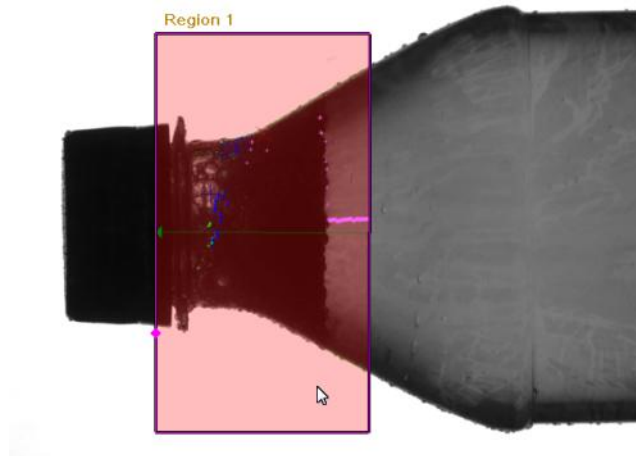
- Add a **Measure ROI** (on page 213) Region of Interest to the inspection tree (if you do not already have one). This region of interest should cover the support ring, a portion of the cap, and enough of the bottle so that it can accurately determine the tilt of the bottle. It should also be able to accommodate some part movement in the camera's field of view, but do not make the region wider than the widest part of the bottle.
- The Measure ROI region of interest should be oriented such that the search direction is pointing towards the cap.
- A sample Measure ROI placement is shown below.



Measure ROI placement for Support Ring 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.

To add a Support Ring 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 in the inspection tree to see the Inspection menu.
3. From the Inspection menu, select Add > Registration > Support Ring. The registration is added to the inspection tree. Re-name it to something more meaningful to you.
4. The Support Ring 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.



Support Ring Registration menu

Use the Support Ring Registration tab to locate the support ring. Use the settings recommended by Pressco support engineers, and adjust as necessary for your part.

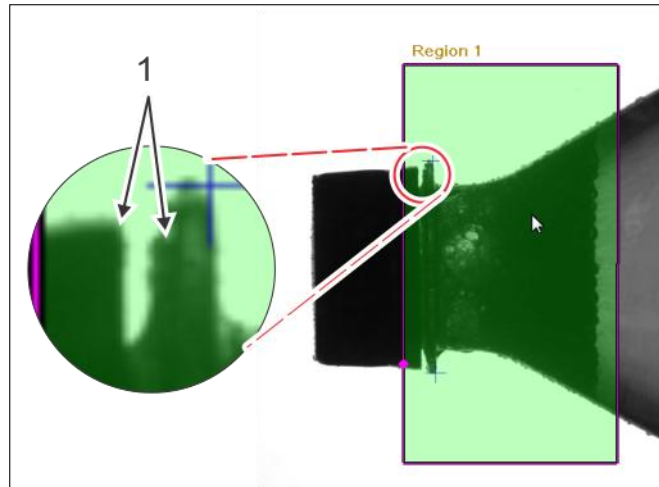
❖ *Tip: use the **Learn Settings** button to allow the system to automatically learn the parameters for this menu. Then adjust the remaining parameters as necessary.*

Support Ring Search	
Measure ROI(s) Support Ring Registration Part Search	
Search Technique	Support Ring with Gap
Apply Support Ring Search	☒ Enabled
Applied Results	Center and Orientation
Support Ring Threshold	15
Support Ring Delta	10
Support Ring Thickness	5
Support Ring Percentage	15
Centerline Start Offset	10
Learn Settings	Learn Settings
☒ Tilt Limits	0.0° +360.0° / -360.0°
☒ Distance Limits	614.0@ +613.0@ / -604.0@
Show Vectors	☐ Enabled
Show Support Ring Vectors	☐ Enabled
Show Search Direction	☐ Enabled

Search Technique

Choose a technique based on your part type:

Support Ring with Gap - This works well with parts that have a support ring and a closure that does not sit right on top of the support ring. The system looks for a transition out from the part (Support Ring Threshold), followed by a width (Support Ring Thickness), then a return back toward the part (automatically set as a percentage of the threshold). An example is shown below. [item 1 = gap].



Support Ring with No Gap - This works well when the closure sits right on top of the support ring. The system looks for a transition out from the part (Support Ring Threshold), followed by a width (Support Ring Thickness).

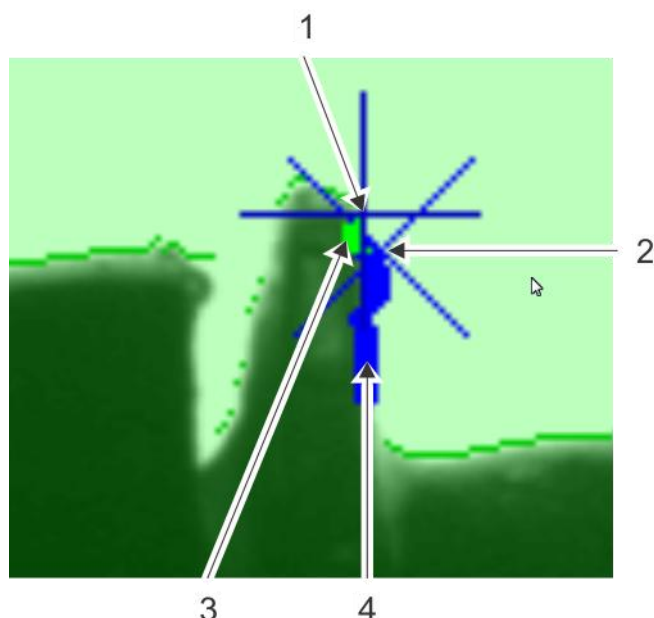
Furthest Out Feature - This works well with parts that do not have a visible support ring. The system looks for the feature that is furthest out, within the field of view. Make sure the search region is not too far down on the bottle. Support Ring Threshold, Delta, and Thickness are not used. An example of a part where this feature would be used is shown below.



Apply Support Ring Search

This is a re-computed location to determine the position of the support ring, after Support Ring Percentage is used. Initially, the system finds a candidate for support ring position, shown [item 2] in the illustration below. Apply Support Ring Search can find a more accurate position. This parameter is most often used with **Support Ring With Gap** Search Technique.

If you are using other search techniques, then you may get better results with Apply Support Ring Search turned off. The example orange juice bottle shown above (under Furthest Out Feature) is a case where the support ring cannot be used for the search. Therefore, we would keep Apply Support Ring Search off for the orange juice bottle.



1	Large '+' is the re-computed location used when Apply Support Ring Search is enabled.
2	Large 'X' is the initial support ring position found. It is <i>not</i> used when Apply Support Ring 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 support ring position. Percentage of edges is set by Support Ring Percentage .
4	Blue edges are ignored. Percentage of edges is set by Support Ring Percentage .

Applied Results

The Support Ring 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.

Support Ring Threshold

The minimum distance you expect the support ring 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 support ring.

Support Ring Delta

The number of pixels between each edge comparison that the system looks for transitions that indicate the support ring. The system looks at the edge profile of the bottle. A typical setting is 10.

Support Ring Thickness

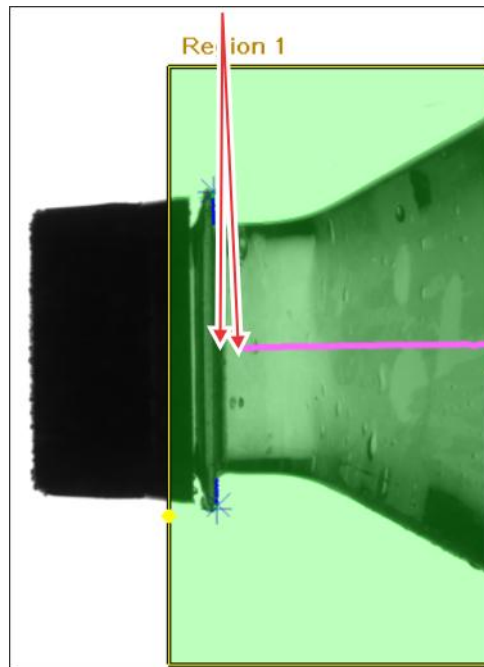
The minimum width (in pixels) that you expect the support ring to be. You can usually set this to a small value, such as five.

Support Ring Percentage

The percentage of vectors that will determine the bottom of the support ring. This is used to eliminate false edges that might occur if water droplets are hanging from the bottom of the support ring. 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 Support Ring Search** above.

Centerline Start Offset

The distance, in pixels, below the support ring, 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 support ring 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.



Learn Settings

Click this button to automatically set the parameters to find the support ring edges.

Tilt Limits

Set the allowed range of tilt of the part within the image.

Nominal

The expected range of tilt.

Distance Limits

Specify the minimum and maximum distance between the two reference points.

Nominal

The ideal distance.

Show Vectors

Show the search lines on the image.

Show Support Ring Vectors

Show the gray vectors that are searching for the support ring.

Show Search Direction

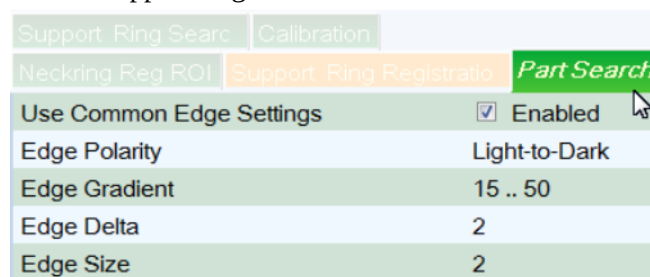
Show the search direction of the vectors with an arrow.

Show Edges

Show the found edges on the image.

Part Search menu

The settings in this menu determine which edges are used to find the sides of the bottle and the support ring.



Use Common Edge Settings

Typically, you would leave this box un-checked. This allows the search for the support ring 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 Support Ring 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 support ring.

Edge Polarity

The type of edge for which you want the system to look – 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 increases inspection sensitivity 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.

Calibration menu

Use this menu to program the system to translate pixels into your desired units of measure (mm, for example).

Support	Ring Search	Calibration
Calibration Mode	Inspection Calibration	
Units	Pixels	
Conversion Factor	1.0	
Learn Calibration	Learn Calibration	
Save Calibration	Save Calibration	
Measured Distance	-1.0	

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 150) 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.

Support Ring Search menu

Use the Support Ring Search menu to determine which edges are used to find the support ring.

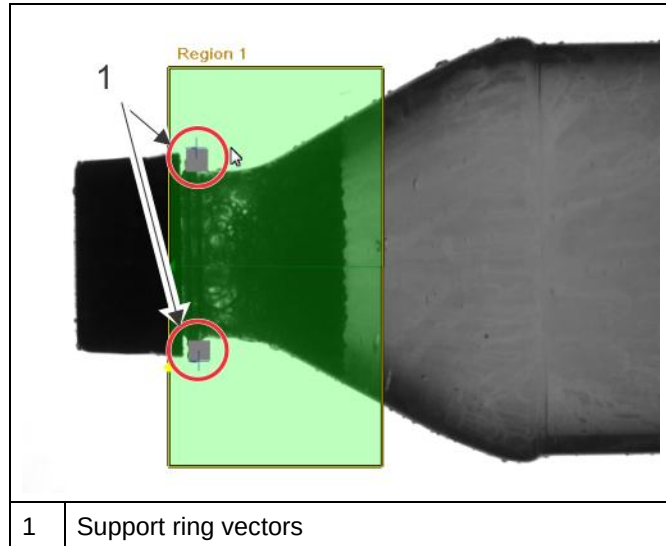
Support Ring Search	Calibration
Support Ring Vector Length	80
Edge Polarity	Light-to-Dark
Edge Gradient	30 .. 75
Edge Delta	2
Edge Size	4

-
- ❖ *Note: if "Use Common Edge Settings" is enabled on the Part Search tab, then only Support Ring Vector Length is visible on this tab.*
-

Support Ring Vector Length

The length, in pixels, of the vectors that search for the support ring.

You can see the support ring vectors when you enable "Show Support Ring Vectors" in the Support Ring Registration tab.



Edge Polarity

The type of edge for which you want the system to look – 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 increases inspection sensitivity 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.

ANALYSES

These 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 208) where you want the analysis to take place. We also recommend a **Registration** (see "**Registrations**" on page 215) and an Orientation (depending on the part type) prior to an analysis.*

The available types of analyses are:

- Ambient
- Shape Check
- Contrast
- Measurement
- Light Meter
- **Fill Height** (on page 234)
- Measure Extract
- **Distribution** (on page 242)
- Label Skew Extract

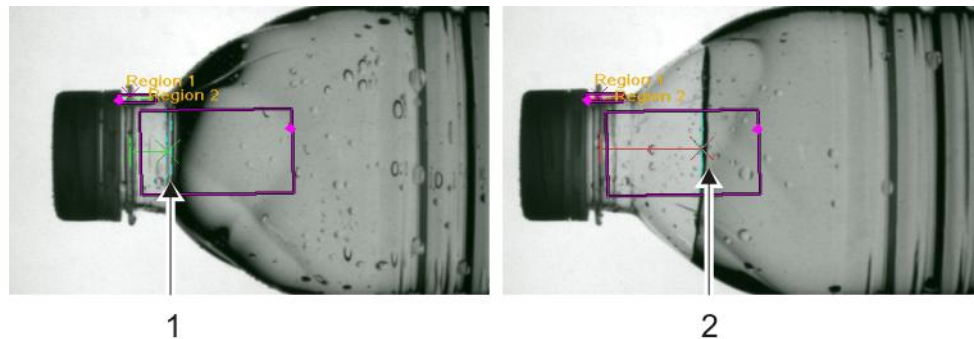
- ❖ *Note: Your system (and this book) may show only those items that apply to your application.*

Fill Height

Fill Height inspection is used for determining the fill level of containers, mainly to find containers with high fill or low fill. The Fill Height inspection compares the fill level of the liquid to a standard reference point, which is typically the neck ring of a container.

- ❖ *Notes: This inspection requires a **Measure ROI** (on page 213) Region using two regions.*
- ❖ *If your bottle's fill level or foam goes into the closure, or way below the fill region, then the fill height may not be detected. We recommend the **Fill Height - Segmented** (on page 242) inspection (still under construction as of this publication) for these cases.*

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].

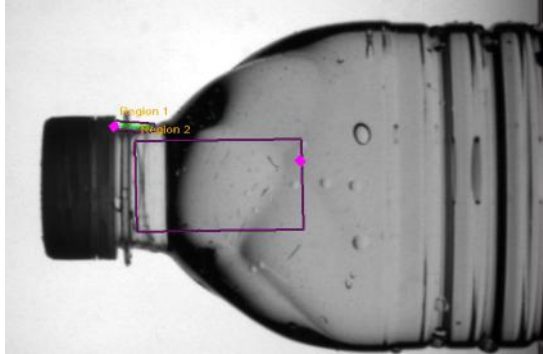


1	Normal fill height
2	Fill height too low

Before adding a Fill Height inspection:

Make sure a **Measure ROI** (on page 213) Region of Interest has been added to the inspection tree. Suggested settings are as follows:

- In the Measure ROI menu, set Region Count to Two Regions.
- Place Region One over a distinct reference point, such as the neck ring. Set the search direction (yellow diamond) to search towards the top of the cap.
- Place Region Two over a section of the bottle where you expect to see the liquid level. Set the search direction (yellow diamond) to search towards the bottom of the bottle.
- An example is shown below.
- Save and close the Measure ROI region menu.



To add a Fill Height inspection:

1. Highlight the Measure ROI region name in the inspection tree.
2. Right-click in the inspection tree to see the Inspection menu.
3. From the Inspection menu, select Add > Analysis > Fill Height. The analysis is added to the inspection tree. Re-name the inspection to something more meaningful to you.
4. The Fill Height menus are displayed and the regions are shown on the image. (The menus are described below) Adjust the placement of the regions and parameters as necessary.

Fill Height 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 158) or **Image Analysis** (on page 150) for the current sensor.*
-

Use this menu to set the reject limits for the fill height of the bottle. Note that you may need to adjust the settings in the **Reference** or **Fill Height** menus before setting the Fill Height limits.

Empty / Full	Calibration
Measure ROI(s)	Fill Height
Reference	Fill Top
Fill Botto	
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

Fill Mode

Choose whether to measure fill level at the Top Only or at the Top and Bottom

Top Only is generally used for water or other non-carbonated beverages.

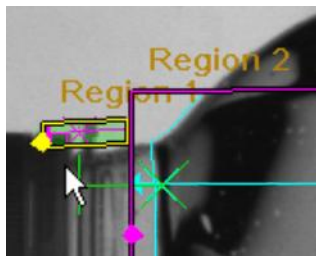
Top and Bottom is used mainly for carbonated beverages, or beverages that foam when the liquid sloshes around in the container as it moves in front of the inspection module. The inspection can measure the distance from the reference point to the top of the foam, and also from the reference point to the bottom of the foam.

Part Orientation

Choose the orientation of your part. In many cases, the part image is sideways to optimize the inspection area on the screen.

Reference Region

Choose a region from the Measure ROI region of interest to set as the reference point (in our setup example, we picked Region 1). A typical setup uses the neck ring of a bottle as the reference region. The direction of the search is determined in the region setup (search towards the diamond). You can change search direction by right-clicking over the image and using the choices from the **Image Options** (on page 179) menu.



Fill Ratio

[Available when **Fill Mode** = **Top and Bottom**] Set the percentage of the distance from the bottom edge (top of the liquid) to the top edge (top of the foam). The percentage used depends on the type of liquid in the container. Usually, a value of 25% works well.

Correct Fill Position

Enables edge correction, where the system uses a "moving average" technique to eliminate outlying edges (example: edges caused by water spots or bubbles in the liquid).

Fill Correction Deviation

[Available when Correct Fill Position is enabled] This is used to correct stray points that fall too far away from the moving average edge position. The value is in pixels. Make sure you use a high enough value, or the inspection will not properly detect sloshing liquid. A common value to use is 25 or higher.

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.

Show Fill Height

Show the fill height measurement on the image.

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).

Reference menu

Fill	Height	RO	Fill Height	Reference	Fill Top	Calibration
Vector Spacing					1	
Max Missed Edges					6	
Edge Polarity					Light-to-Dark	
Edge Gradient					70 .. 255	
Edge Size					2	
Edge Thickness					1	
Edge Delta					3	
Show Edges					☒ Enabled	
Show Vectors					☐ Enabled	
Show Search Direction					☐ Enabled	

Set the parameters to find the edges in the reference region.

Vector Spacing

The distance between search vectors.

Max Missed Edges

The number of search vectors that are allowed to fail without causing the inspection to fail.

Edge Polarity

The type of edge for which you want the system to look – 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 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.

Edge Thickness

The number of consecutive times that the gradient must be met to define an edge.

Edge Delta

The distance between pixels being compared when seeking an edge. A higher Delta value increases inspection sensitivity because it finds more edges.

Show Edges

Show the found edges on the image.

Show Vectors

Show the search lines on the image.

Show Search Direction

Show the search direction of the vectors with an arrow.

Fill Top or Fill Bottom menu

Fill	Height RO	Fill Height	Reference	Fill Top	Calibration
Vector Spacing				1	
Search Direction				☐ Flipped	
Max Missed Edges				95	
Edge Polarity				Light-to-Dark	
Edge Gradient				5 .. 45	
Edge Size				2	
Edge Thickness				1	
Edge Delta				1	
Show Edges				☒ Enabled	
Show Vectors				☐ Enabled	
Show Search Direction				☐ Enabled	

Set the parameters to find the edges for the fill level top (Fill Top menu) or the fill level bottom (Fill Bottom menu).

Vector Spacing

The distance between search vectors. Normally kept at one.

Search Direction

If the box is checked, the search changes to the opposite direction.

Note: If you are using both Fill Top and Fill Bottom menus, then one of the search directions is usually flipped from the direction indicated in the Measure ROI. You are not required to flip the search direction, since you can change the Edge Polarity to achieve the same effect.

Max Missed Edges

The number of search vectors that are allowed to fail without causing the inspection to fail.

Edge Polarity

The type of edge for which you want the system to look – 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 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.

Edge Thickness

The number of consecutive times that the gradient must be met to define an edge.

Edge Delta

The distance between pixels being compared when seeking an edge. A higher Delta value increases inspection sensitivity because it finds more edges.

Show Edges

Show the found edges on the image.

Show Vectors

Show the search lines on the image.

Show Search Direction

Show the search direction of the vectors with an arrow.

Empty/ Full menu

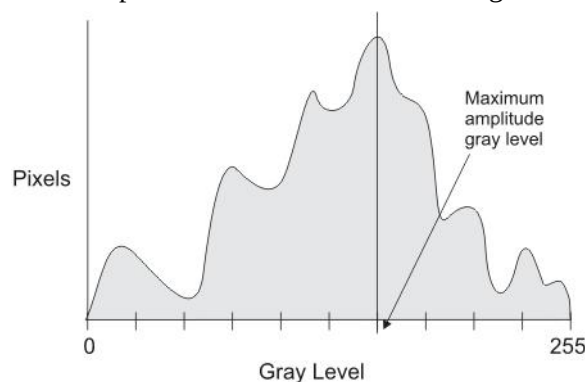
Calibration	
Measure ROI(s)	Fill Height
Reference	Fill Top
Empty / Full	Empty / Full
Empty / Full Check	☒ Enabled
Ambient Technique	Density
Ambient Threshold	80.0
Ambient Analysis Mode	Min & Max
☒ Ambient Limits	128 +127/ -128
Reject on Over Fill	☒ Enabled

Use this check to determine whether the bottle is empty or full. The system performs an ambient check in the Fill Height region to determine whether the bottle is empty or full.

Ambient Technique

This method determines the region's ambient. Choose the method through the drop-down menu.

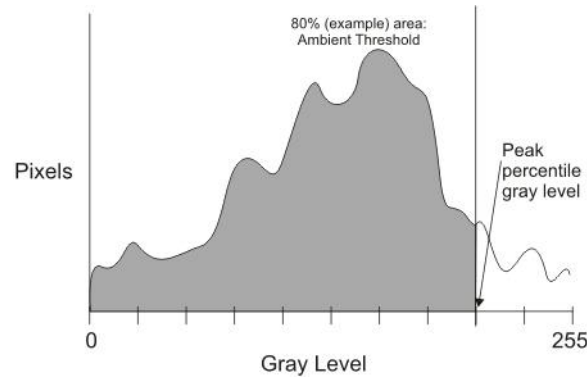
- **Max Amplitude** looks for the maximum gray level amplitude — the gray level with the most pixel counts — within the histogram of the search area.



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.

Ambient Analysis Mode

Specifies the reject criteria.

Min & Max - The minimum and maximum acceptable ambient gray level values. Any computed ambient found lower than or greater than these values will cause the inspection to fail.

Min Only - The minimum acceptable ambient gray level value. Any computed ambient found lower than this value will cause the inspection to fail.

Max Only - The maximum acceptable ambient gray level value. Any computed ambient found greater than this value will cause the inspection to fail.

Ambient Limits

The minimum and maximum acceptable ambient gray level values. Any computed ambient found lower than or greater than these values will cause the inspection to fail.

Nominal

The expected gray level value of the region of interest.

Reject on Over Fill

Check this box to reject bottles that are too full. Un-check the box to pass bottles that are too full.

Calibration menu

Ovality ROI	Fill Height	Reference	Fill Top	Empty / Full	Calibration
Calibration Mode		Inspection Calibration			
Units		Pixels			
Conversion Factor		1.0			
Learn Calibration		Learn Calibration			
Save Calibration		Save Calibration			
Measured Distance		-1.0@			
Measured Fill Level		-1.0@			

Set the parameters to convert pixel measurement into your preferred measurement unit.

- ❖ *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 158) or **Image Analysis** (on page 150) 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 150) 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 neck ring to the normal fill height, in your selected unit of measurement.

Measured Fill Level

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 Measured Fill Level. This is used to help calibrate the measurement.

Fill Height - Segmented

Inspection under construction.

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 246) 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. Highlight the region name in the inspection tree.
3. Right-click in the inspection tree to see the Inspection menu.
4. 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.
5. 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.

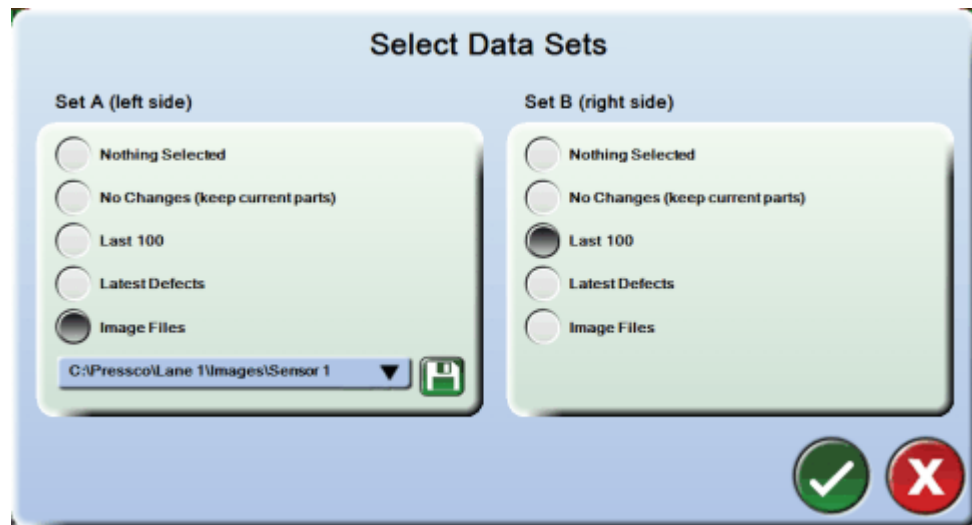
However, you must make sure that all the images in the data set are from good parts. You can look at the Population View graph and delete the images you do not want.

Alternately, you can load a set of known good images that you have saved previously using the steps below.

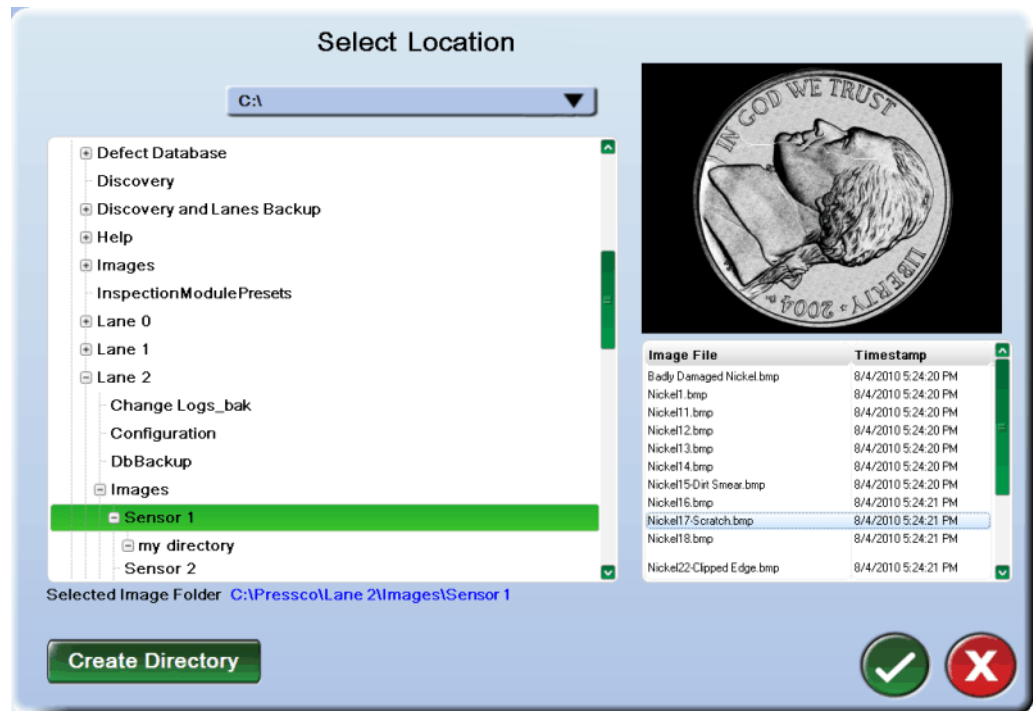
To load Data Set A:

1. Look at the **Retro-Spec Population View Graph** (on page 200).

2. Click the left arrow  button to view the **Select Data Sets** menu.



3. Click the Image Files button for Set A.
4. Click the disk icon  to browse to the folder where the images were saved. The **Select Location** menu is displayed.



5. 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.
6. 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.
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 tab

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 246). 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 Distribution 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.

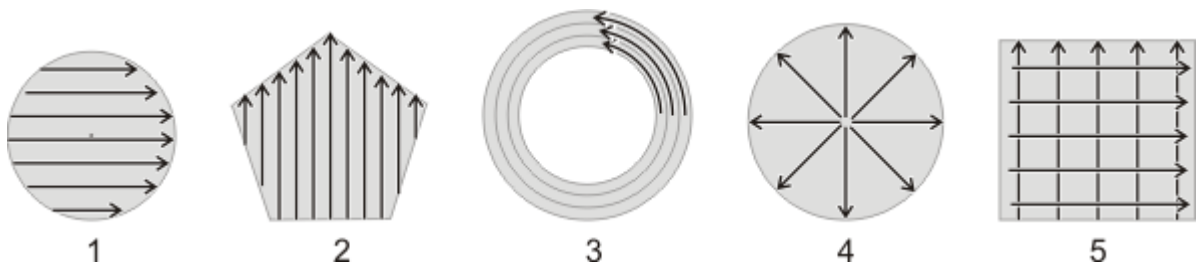
*Note: We recommend that after running the Learn function on 100 parts, you use the **Learn More** button several times to get a good sample population.*

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 246).

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 242) 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 204).



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 208) 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 208) 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 in the inspection tree to see the Inspection menu.
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 - 10000 - 1000	
Nominal	1000	
Learn Nominal Area	Learn	
☐ 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

This allows you to 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

Checks 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

Checks 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 250)
- Angle

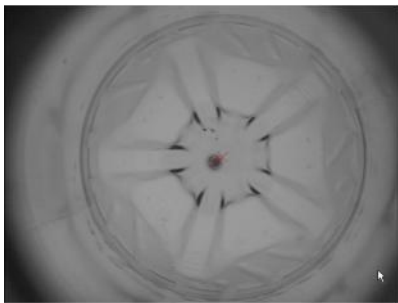
❖ *Note: Your system (and this book) may show only those items that apply to your application.*

Distance

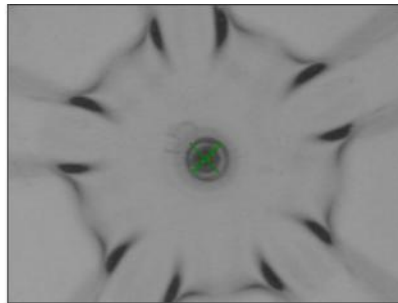
The Distance inspection computes the distance between two points. This is useful if you want to find features that are out of tolerance or out of place on a part. Distance inspection does NOT use a region. It obtains information produced in other inspections. The other inspections can include a Registration (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.

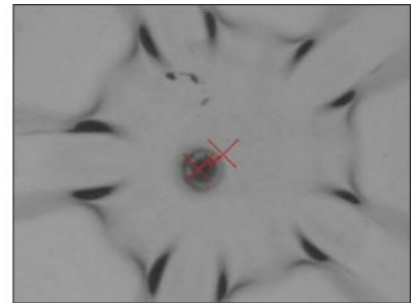
Examples of where Distance inspection might be used is for detecting swung gates or high caps on bottles, turned tabs on converted or EZO ends, or computing finish dimensions. The example below shows a gate position computed with respect to the center of the base.



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:

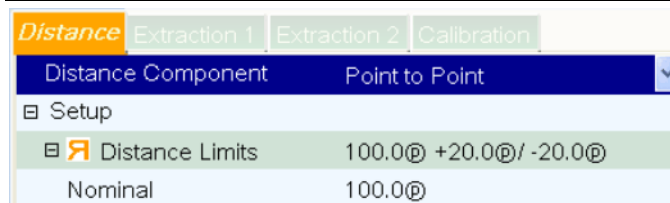
1. Make sure at least one **Registration** (see "**Registrations**" on page 215) or Measure Extract inspection is placed in the inspection tree. To find the distance between two points, place the registrations or Measure Extract inspections for each point.
2. Right-click in the inspection tree to see 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 [Ⓟ] 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 158) or **Image Analysis** (on page 150) for the current sensor.*



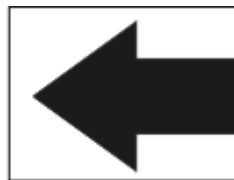
Distance Component

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



2

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

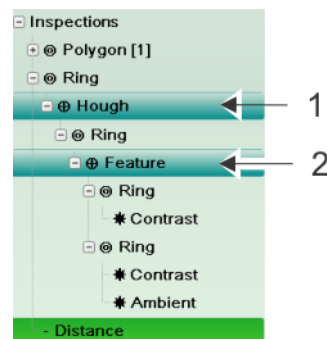
❖ *Note: when only one inspection is used for Extraction, the second reference point used is the center of the screen.*

Distance	Extraction 1	Extraction 2	Calibration
Select Extraction 1	Select Inspection		
Assigned Inspection	UNDEFINED		
Location Provider Type	No Measurements		

Select Extraction

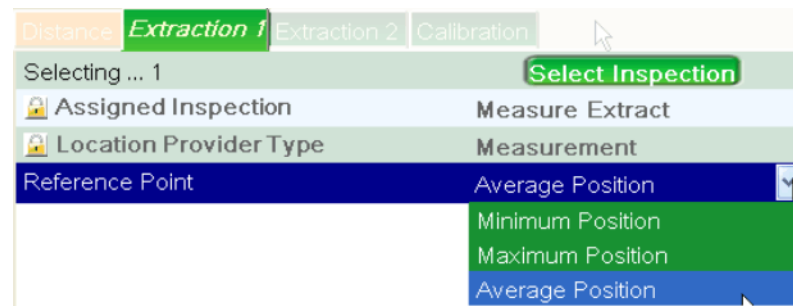
These menus allow you to choose an inspection to use as a reference point for the measurement. Click the **Select Inspection** button, then choose an inspection from the inspection tree. Click the **Select Inspection** button again to set the choice. The Assigned Inspection and Location Provider Type 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.

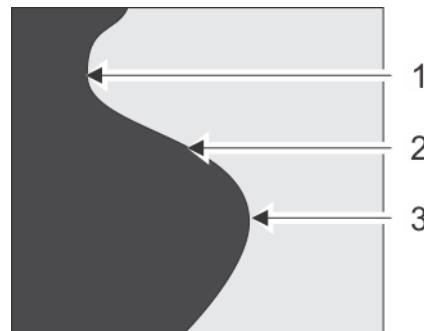


Minimum Position -- The system will use the minimum distance of the search region, and reject parts if the measurement is out of limits.

Maximum Position -- The system will report the maximum distance of the search region, and reject parts if the measurement is out of limits.

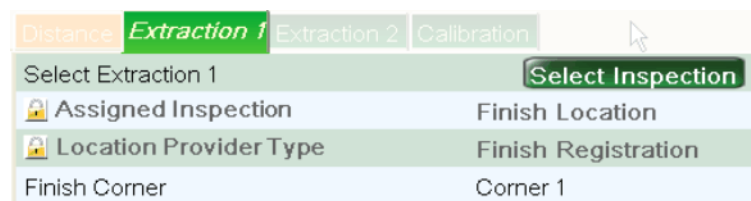
Average Position -- The system will report the average distance of the search region, and reject parts if the measurement is out of limits.

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).

Distance	Extraction 1	Extraction 2	Calibration
Calibration Mode	Inspection Calibration		
Units	Pixel		
Conversion Factor	1.0		
Learn Calibration	<button>Learn Calibration</button>		
Learn Calibration	<button>Save Calibration</button>		
Measured Distance	-1.0		

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 150) 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 13

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
2	Integrated NEMA4X Operator Interface with trackball
3	Four segment light tree device

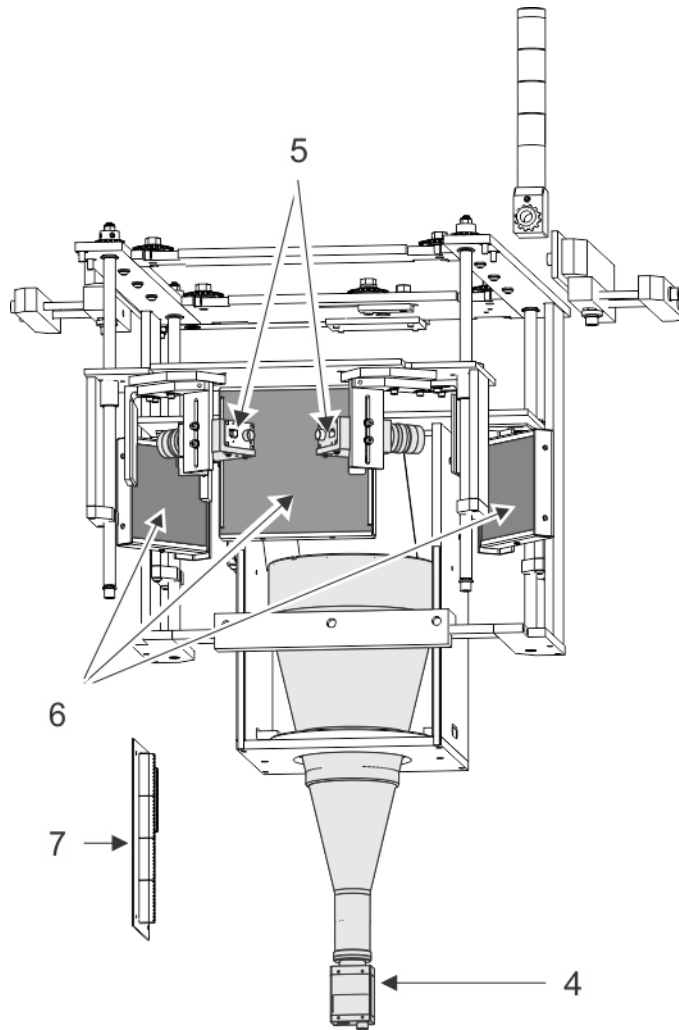
Also included but not shown in the photo are:

- One wall-mounted processor with stainless steel cover
- Part Tracking and Rejection Control
- Pneumatic Pusher Rejecter with Stainless Steel Floor Stand

Optional components available are:

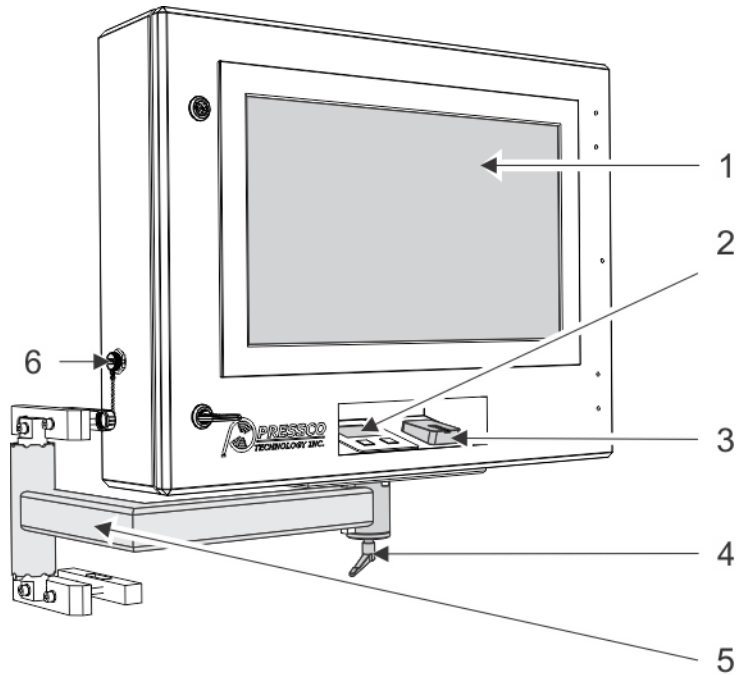
- Touch Screen User Interface
- Biometric Scanner for secure login
- Stainless Steel Feet for Pressco Pedestal Controller

The following illustration shows some internal components of the module.



4	One High Resolution black and white camera, 1,360 x 1024 pixels, for fill height inspection. This includes a telecentric lens.
5	Two Standard Resolution color cameras, 640 x 480 pixels, for cap inspection
6	Three solid-state lighting modules with programmable multiple zone and directional control.
7	Extended Discrete I/O board (optional). Extended I/O (on page 293)

FHCP 3X USER INTERFACE HARDWARE



The monitor housing contains:

	KVM (keyboard, video, mouse) switch. Internal - not shown.
1	User interface monitor. <i>Touch Screen Monitor (optional)</i> (on page 33)
2	Glide pad with buttons to move cursor and select items on the screen.
3	<i>Biometric login device</i> (on page 33) (optional)
4	Handle to lock monitor in place
5	Adjustable arm
6	USB convenience port

FHCP 3X MODULE POWER SWITCH

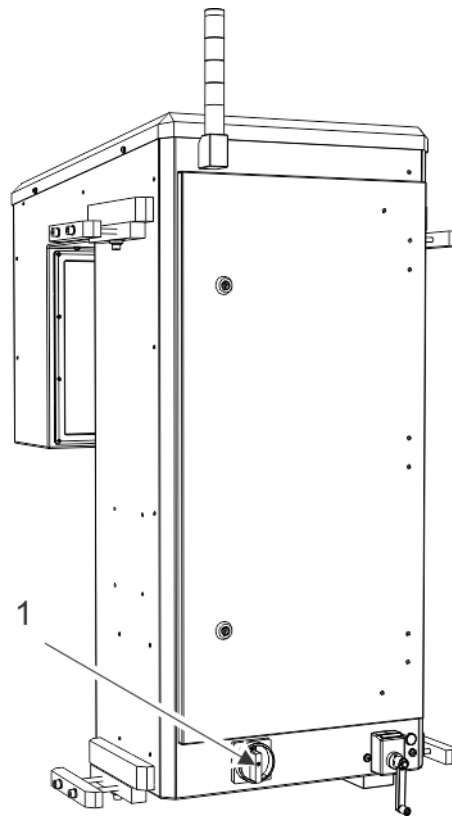
The power switch for the inspection module is located on the panel, as shown below. Use this switch as an extra precaution to shut down power to the inspection module when you need to service the module. It will ensure that power remains off at the module, even if someone else turns on the main power switch for the system.

❖ *Note: use the main disconnect switch to power the system on and off, or to restart the system, instead of this module power switch. **Power On/ Off** (on page 23)*



Warning

The power switch on the FHCP tunnel turns power on and off only at the tunnel, not the vision processor. Use the power switch at the main shut off for controlled shut down of the vision system.



1	Power switch for FHCP tunnel

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.

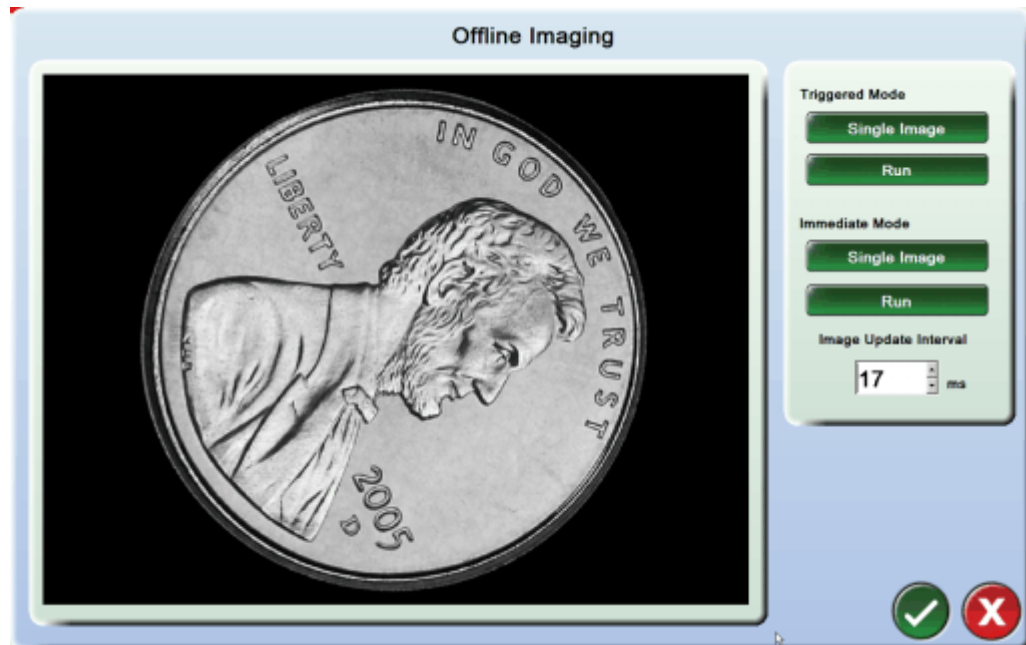


Danger

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 150) 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 259)

Adjust lighting through either:

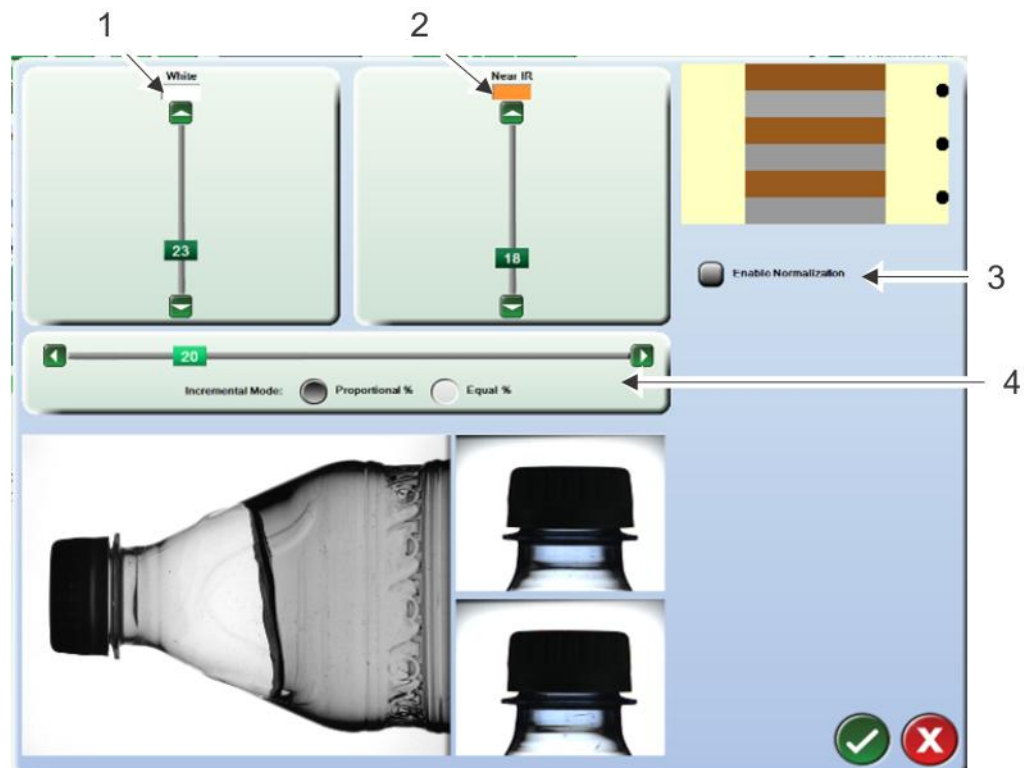
- **Basic adjust lighting** (on page 154), or
- **Advanced adjust lighting** (on page 155)

Most often, you will use Basic Adjust Lighting.

Lighting for FHCP 3X Systems

Typically, **Basic Adjust Lighting** (on page 154) 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 155).

BASIC ADJUST LIGHTING SCREEN



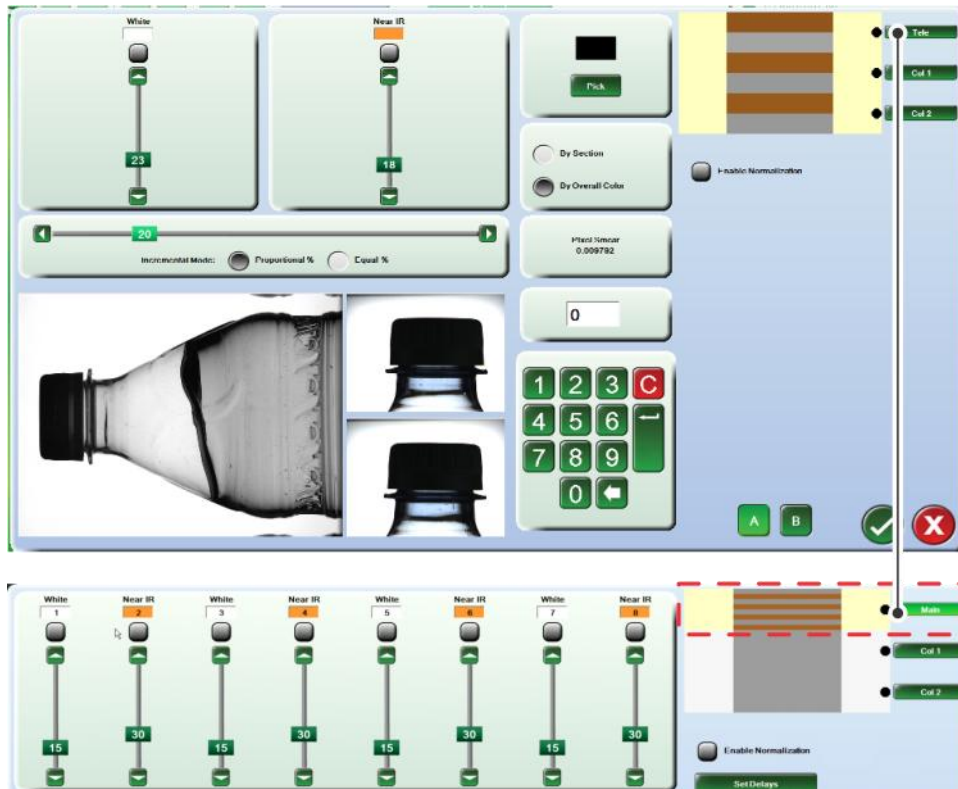
The Fill Height and both Cap cameras use white and Near infrared (IR) to illuminate the part.

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 155) to set the delays.

Click the button for the desired camera to access the correct screen for the desired camera.



Adjusting Module Height to Conveyor

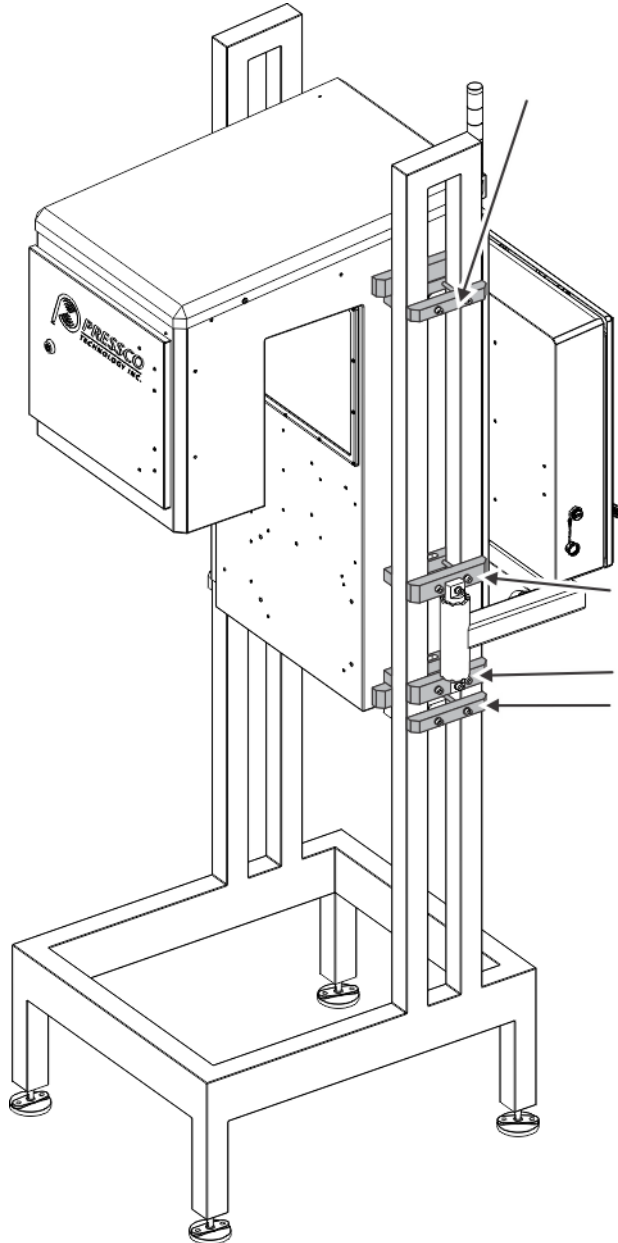
The height of the module should be set properly to the conveyor height during installation. It should not need further adjustment.



Danger

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

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



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 *Wiring Diagram FHCP 3X module - sheet 5* (on page 268).

Replaceable fuses are shown in *Wiring Diagram FHCP 3X module - sheet 1* (on page 264). They include:

FU1	Fuse 1 - 3A 250V 5x20mm Fast Acting. Pressco part number 26543.
FU2	Fuse 2 - 6A 125V 5x20mm Fast Acting. Pressco part number 41953.

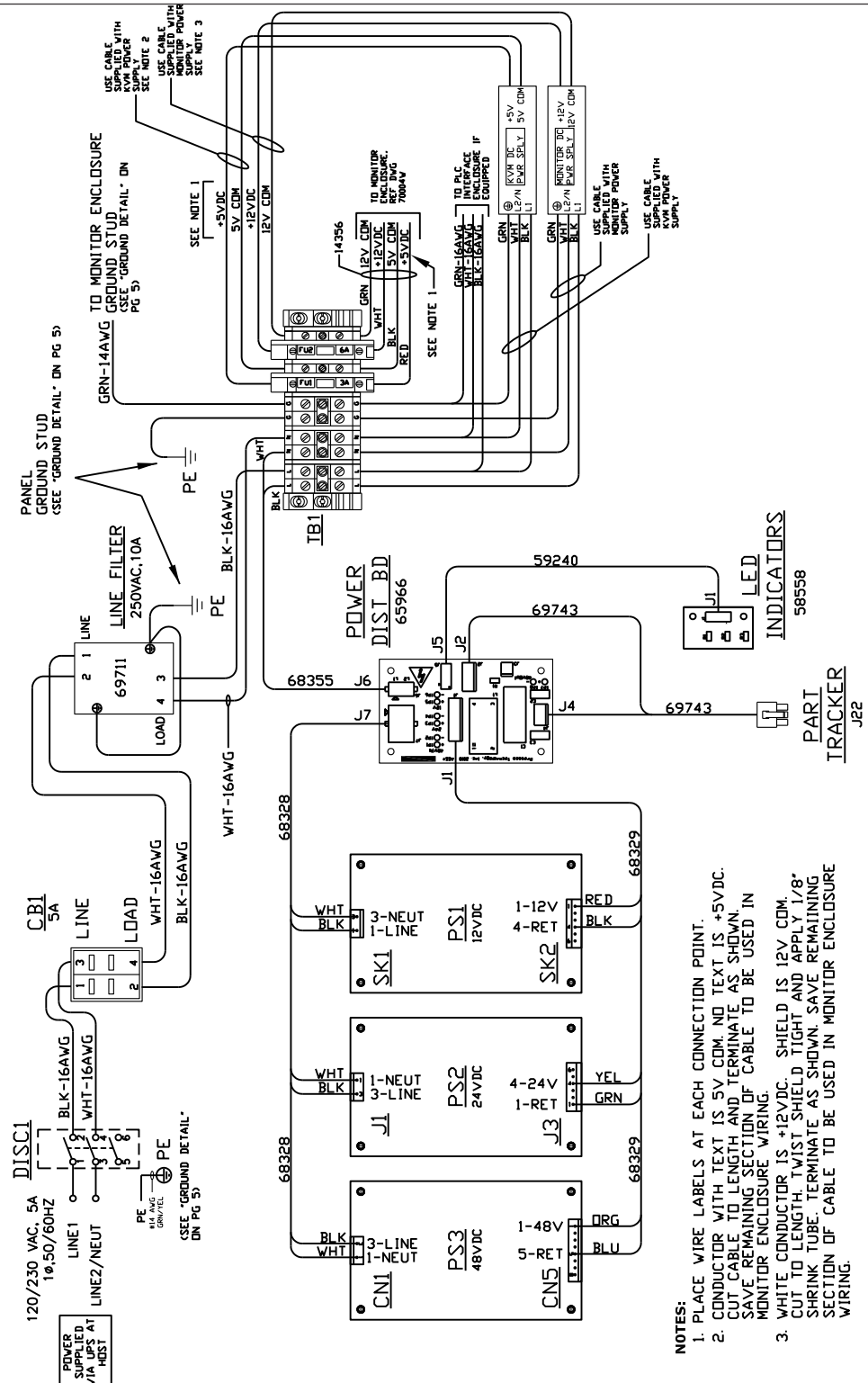
Power to the FHCP 3X Module

Power is supplied to the module through the DISC1 disconnect switch, from the UPS in the host computer. If you shut off the power at the Intellispec cabinet, it shuts off power at the FHCP 3X module.

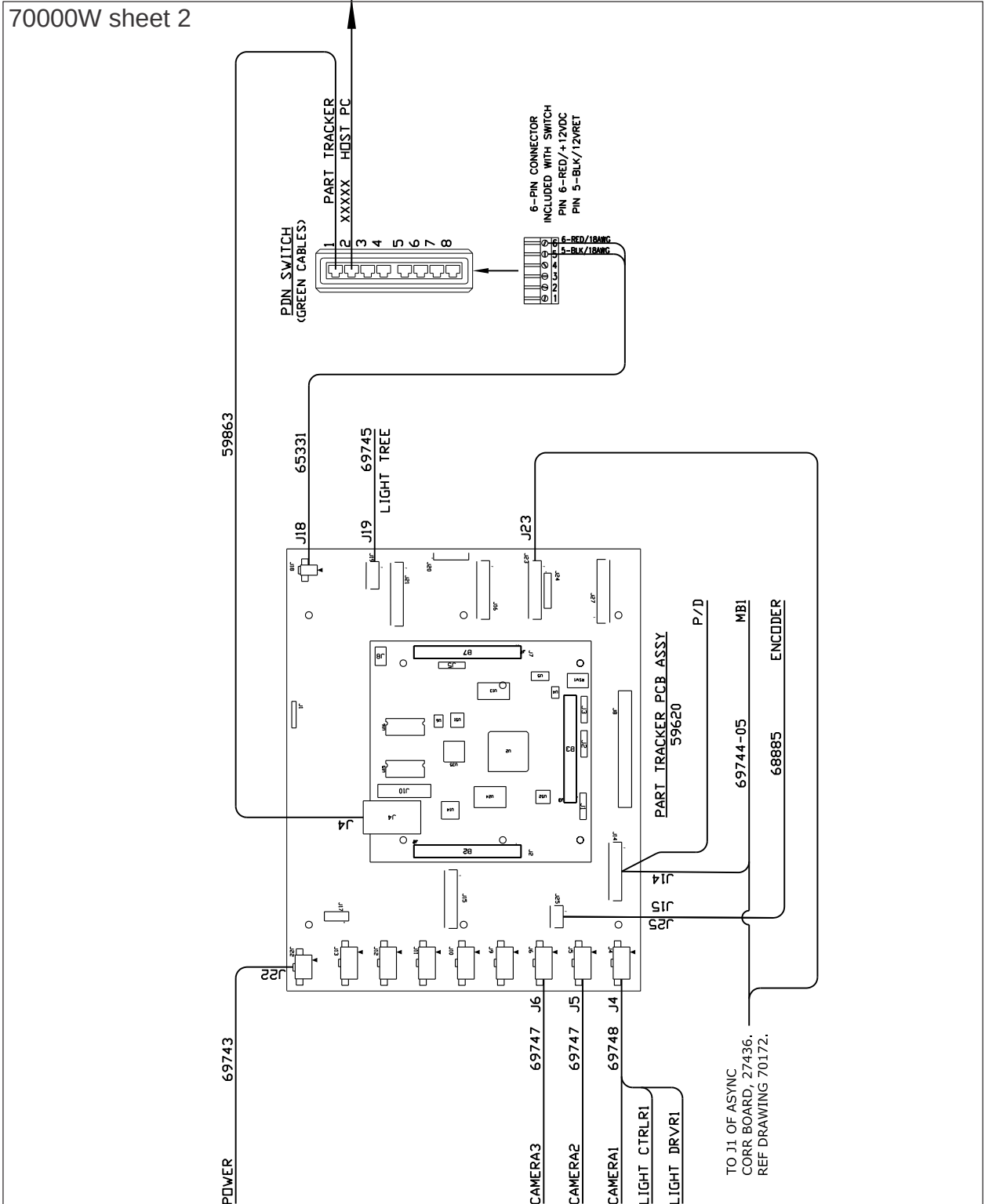
There is a power switch on the front of the FHCP 3X module where you can shut off the power just to the module.

Wiring Diagram FHCP 3X module - sheet 1

70000W sheet 1

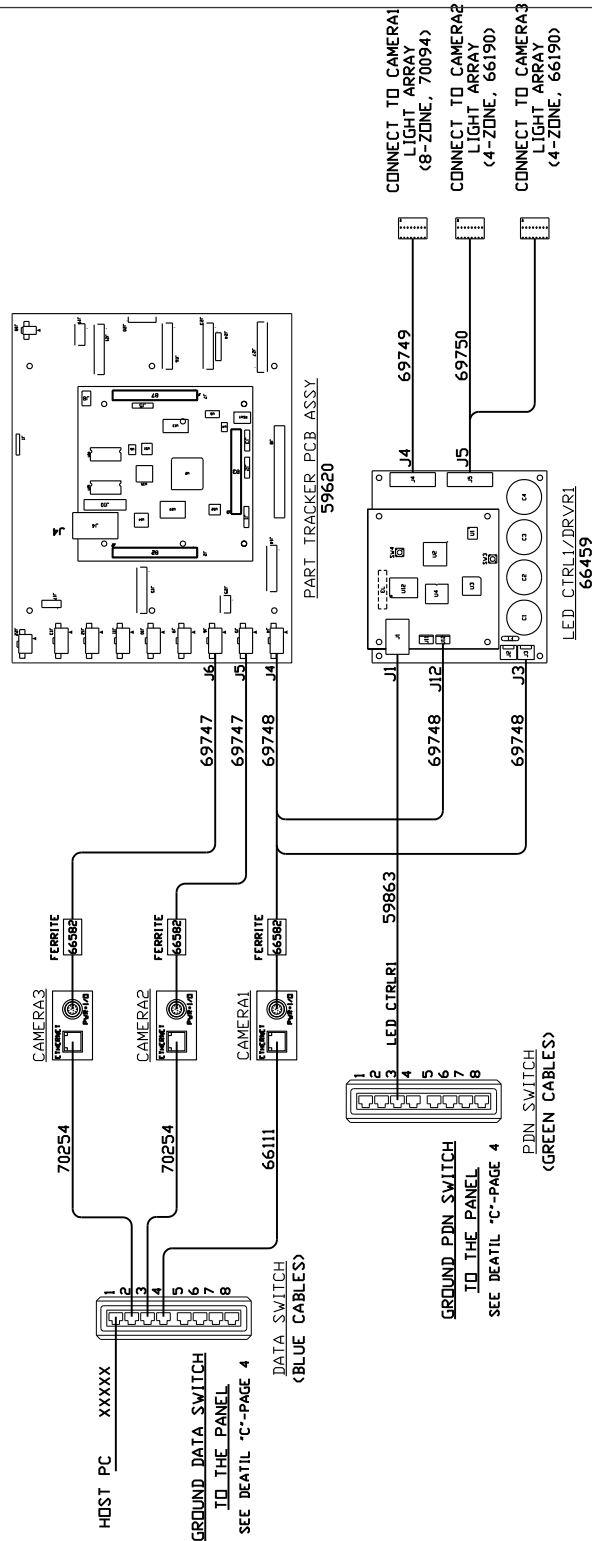


Wiring Diagram FHCP 3X module - sheet 2



Wiring Diagram FHCP 3X module - sheet 3

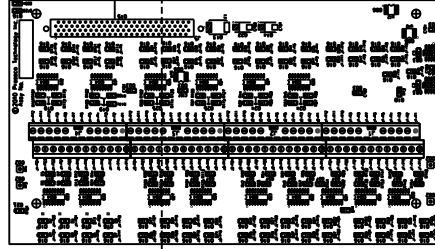
70000W sheet 3



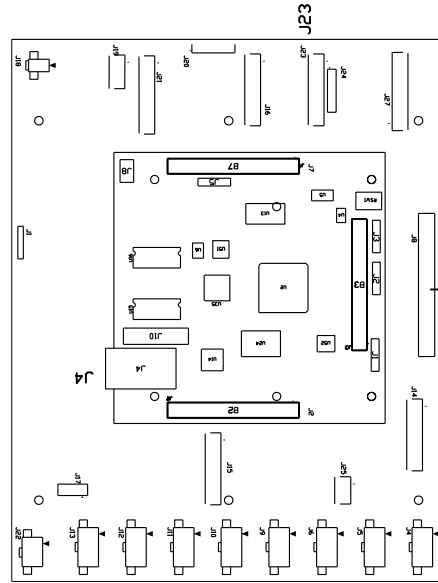
Wiring Diagram FHCP 3X module - sheet 4

70000W sheet 4

EXTENDED I/O PCB ASSY
66043

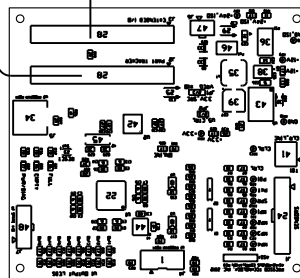


PART TRACKER PCB ASSY
59620



ASYNC_CORRELATION
PCB ASSY
70184

FASTENERS (4) 27436



68176, 18" 100 PIN RIBBON CABLE

70632, 28" 100 PIN RIBBON CABLE

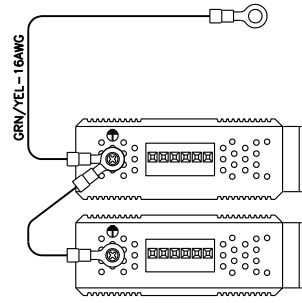
NOTES:

1. USE CLIPS, 10699, TO SECURE RIBBON CABLES TOGETHER.
ONE CLIP SECURES CABLES IN FRONT OF TRACKER BOARD, SECOND CLIP SECURES CABLES TO RIGHT SIDE WALL BEFORE EXTENDED I/O BOARD.

❖ Note: The Asynchronous correlation kit is optional. Systems with main part number 70590 do not have this board and its related components.

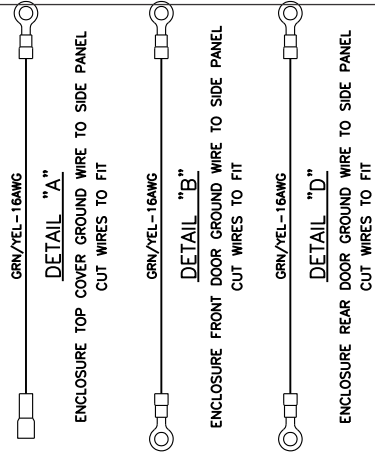
Wiring Diagram FHCP 3X module - sheet 5

70000W sheet 5



DETAIL "C"

ETHERNET SWITCH GROUND
FASTEN TO GROUND STUD
CUT WIRES TO FIT

DETAIL "A"

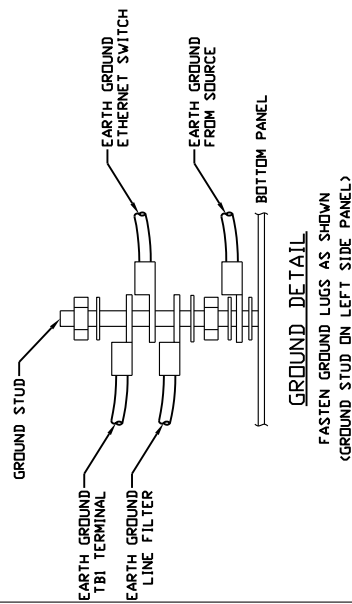
ENCLOSURE TOP COVER GROUND WIRE TO SIDE PANEL
CUT WIRES TO FIT

DETAIL "B"

ENCLOSURE FRONT DOOR GROUND WIRE TO SIDE PANEL
CUT WIRES TO FIT

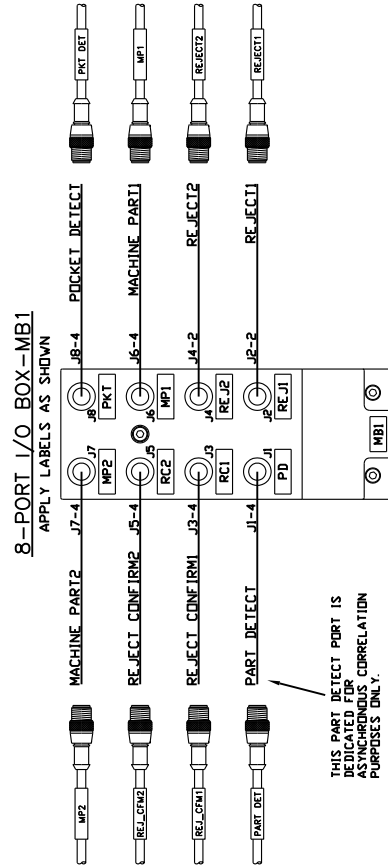
DETAIL "D"

ENCLOSURE REAR DOOR GROUND WIRE TO SIDE PANEL
CUT WIRES TO FIT



GROUND DETAIL

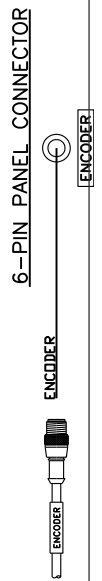
FASTEN GROUND LUGS AS SHOWN
(GROUND STUD ON LEFT SIDE PANEL)



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

ASYNCHRONOUS CORRELATION FHCP 3X

❖ *Note: Asynchronous correlation is included in system part number 70000. System part number 70590 is the same FHCP 3X system, but without asynchronous correlation.*

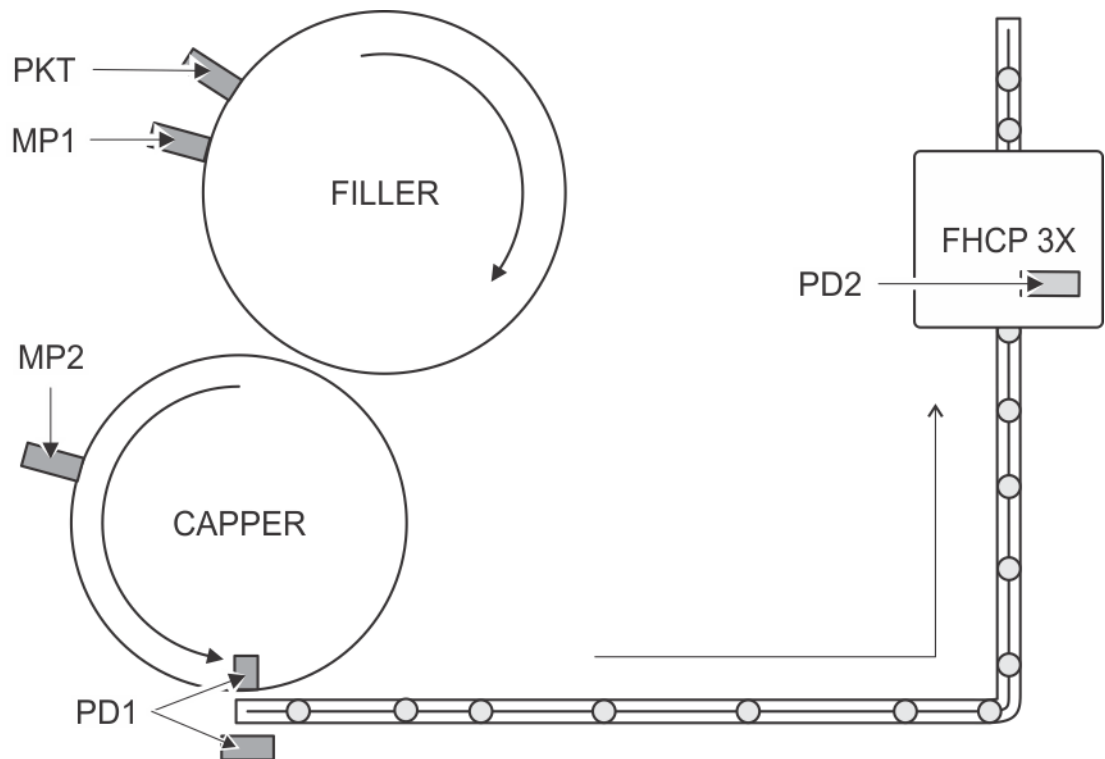
In FHCP 3X systems, you may have an asynchronous correlation board. The asynchronous correlation board is located inside the FHCP 3X inspection module, and is connected to a set of sensors, PKT, MP1, MP2, and PD1. See diagram below. These sensors collect correlation information from your plant's machine 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:

Wiring Diagram FHCP 3X module - sheet 2 (on page 265)

Wiring Diagram FHCP 3X module - sheet 4 (on page 267)

Wiring Diagram FHCP 3X module - sheet 5 (on page 268)

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** (on page 268)

Set up the sensors as follows:

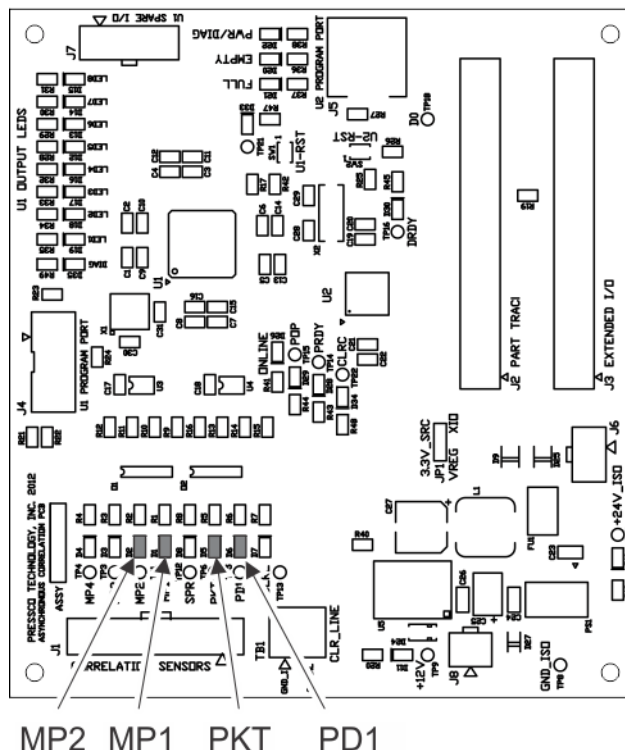
- **PKT** - can be mounted on filler or capper. It detects every pocket.
- **MP1** - triggers once per revolution of the filler wheel
- **MP2** - triggers once per revolution of the capper wheel
- **PD1** - the ultrasonic sensor mounted at the capper exit. It detects each part exiting. It is important 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 Board



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

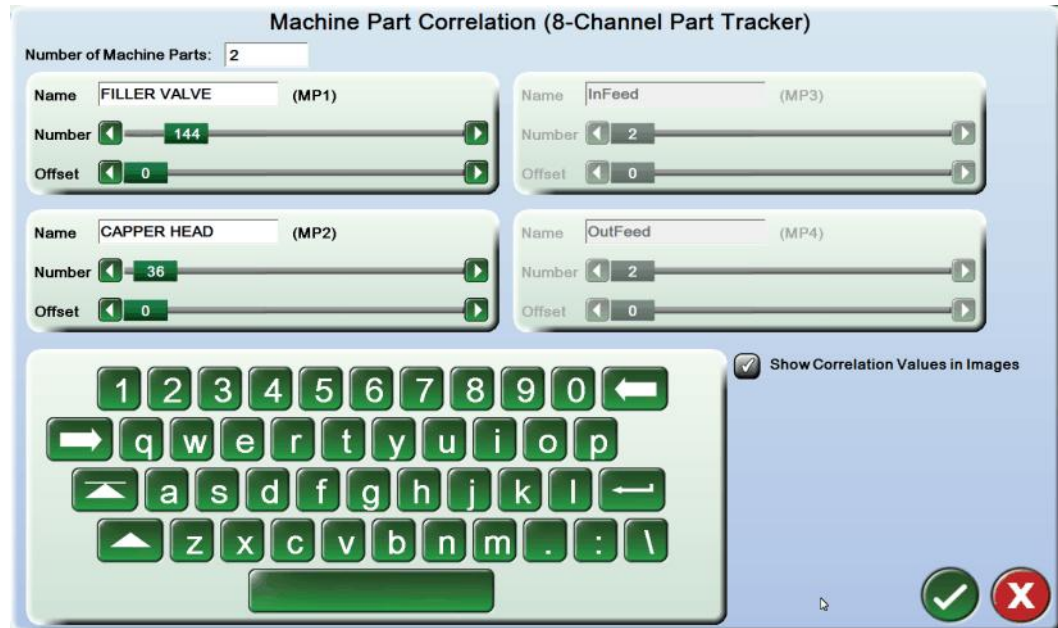
Next, set up the correlation.

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:

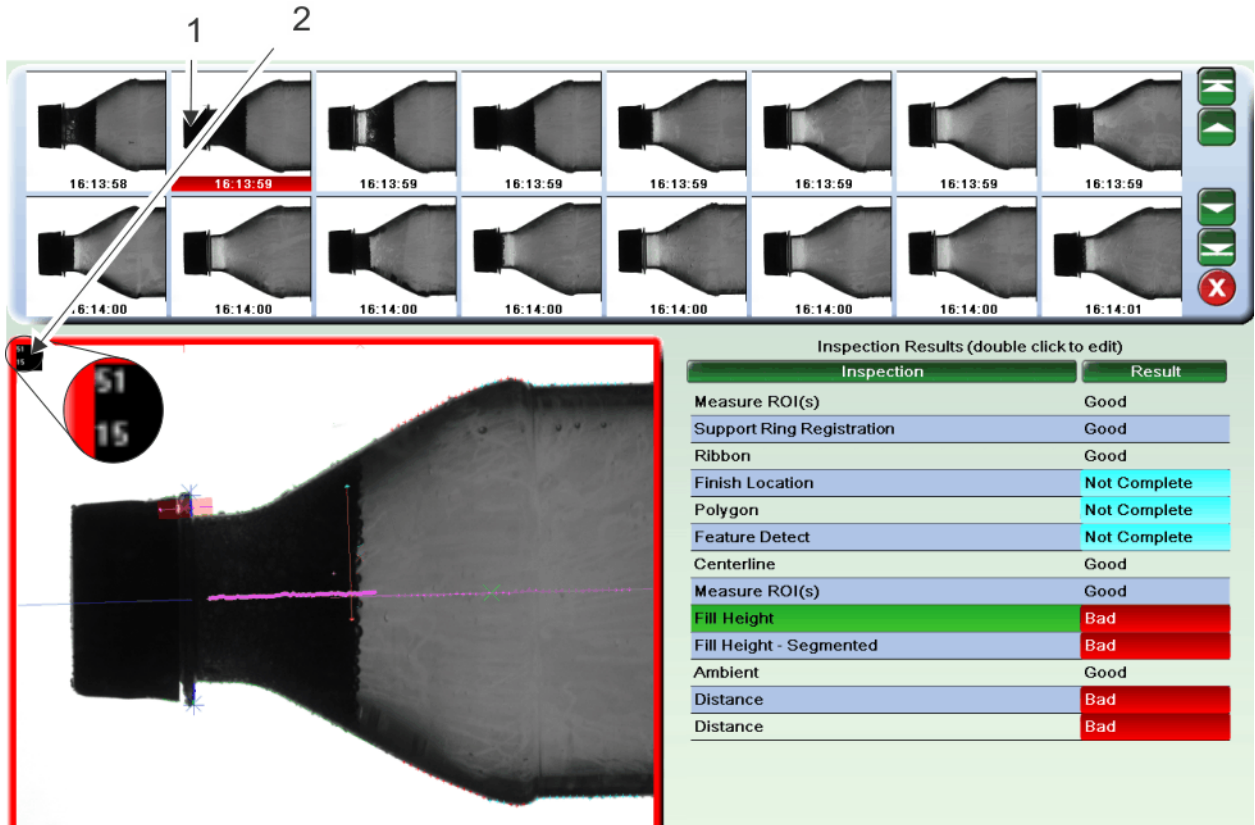
1. Disable the rejectors for all cameras: from Lane Overview mode, click the Tools



button, then select Lane Setup, then select **Rejector Enable/Disable** (see "**Rejector Enable/ Disable**" on page 118).

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 118) menu. You should no longer see the trash can on the Intellispec screen.



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. $[86-19 = 67]$

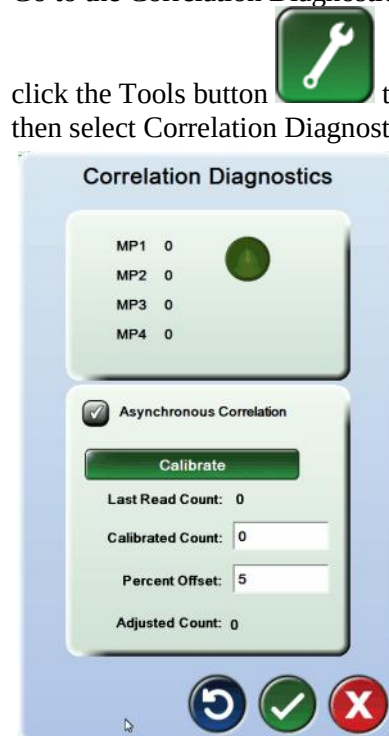
- Example 2: If station 12 on the filler was set to fail, and the system logs it as 73, then set MP1 offset = 83. $[(144-73) + 12 = 83]$. This is because you cannot enter a negative offset.
5. Set the capper offsets in the same manner.
 6. Once the offsets have been made, then continue to run the system 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** 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** 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.

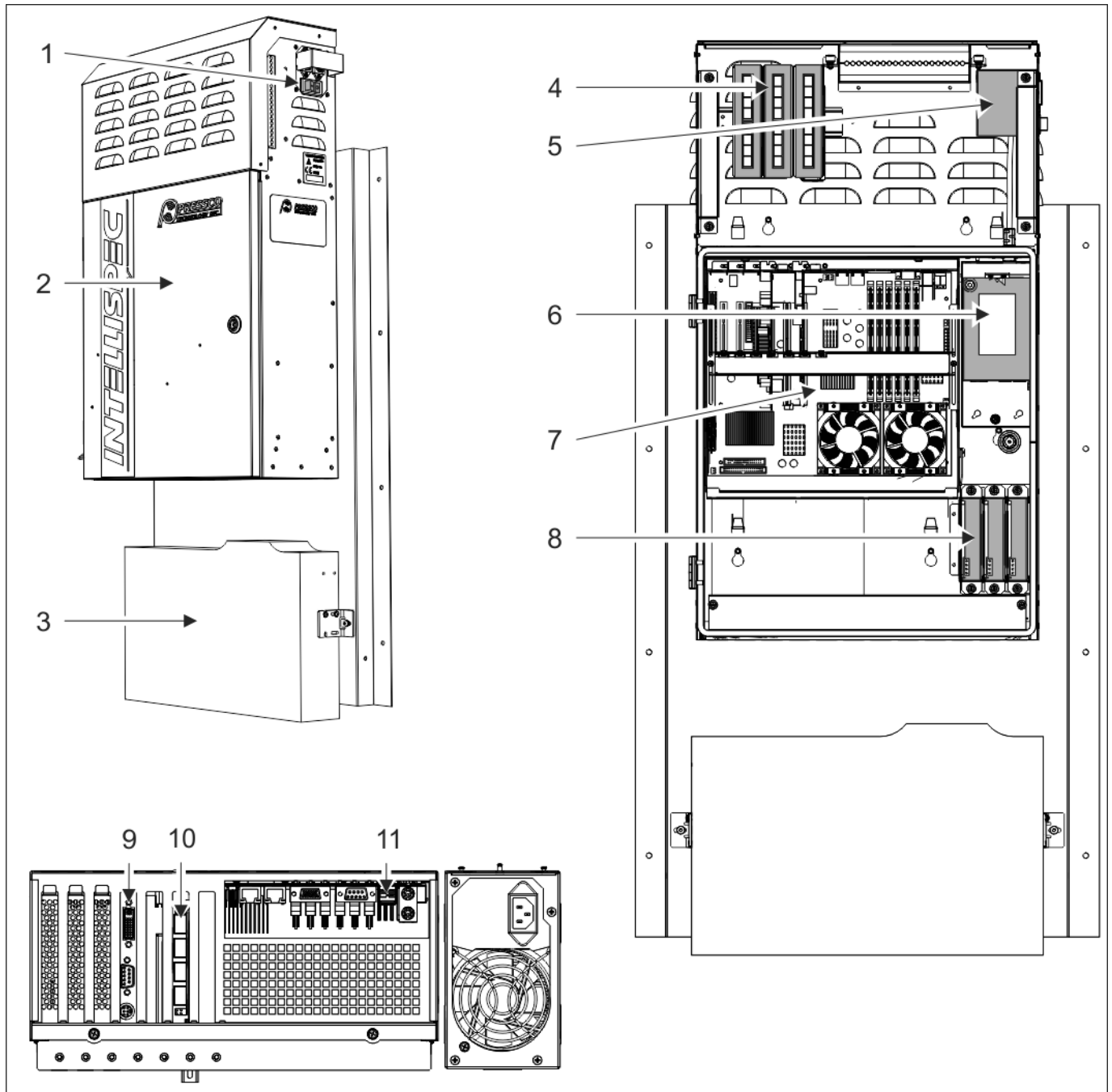
Adjusted Count

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.

INTELLISPEC COMPUTER STANDALONE - STANDARD

The Intellispec cabinet is installed outside of the filling area and is intended for non-wash-down areas only. It can be mounted on a post, rail, or directly on a wall using appropriate mounting hardware.

Computer Enclosure Standalone components

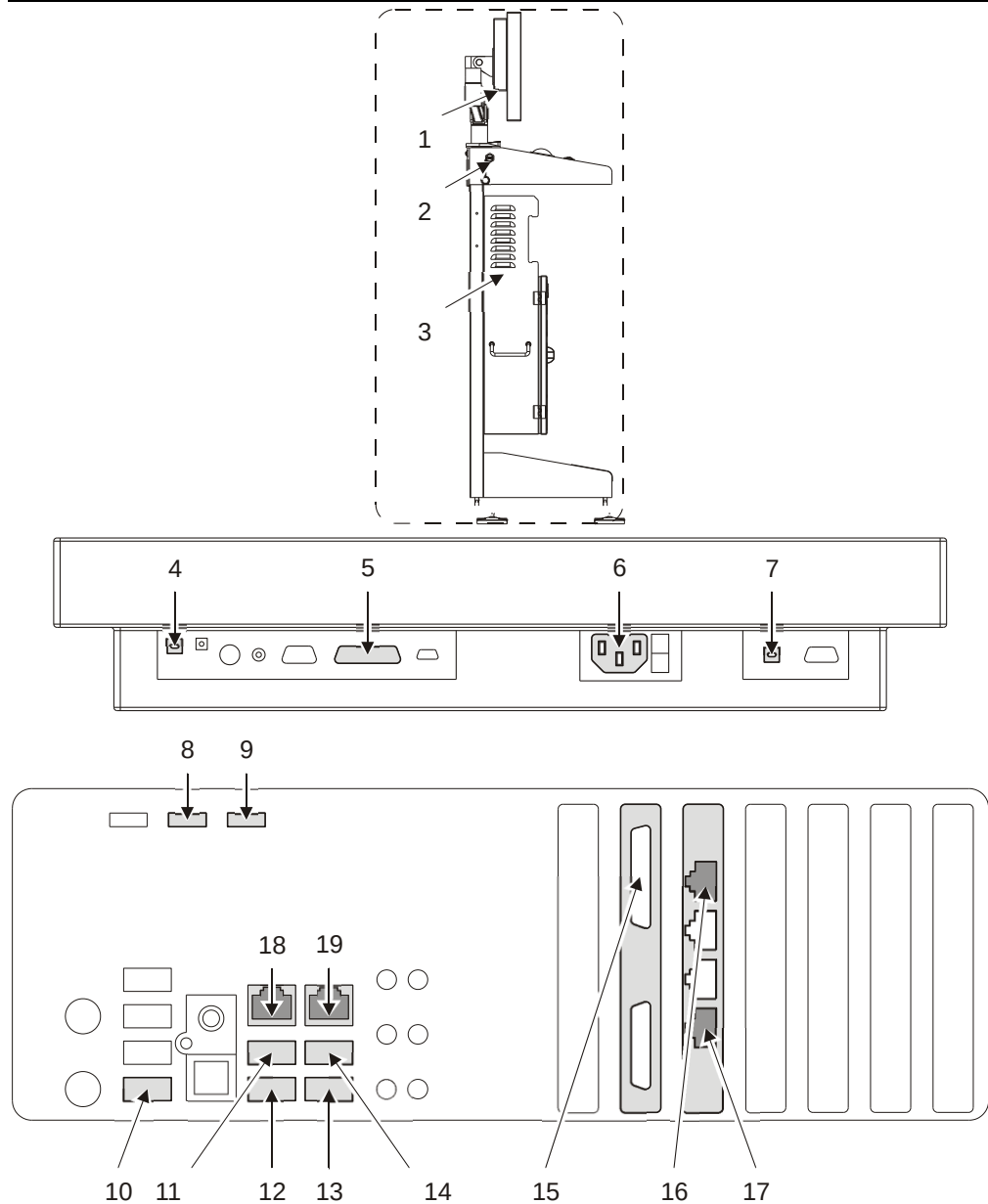


1	Main power switch
2	Computer
3	UPS (uninterruptible power supply)
4	Ethernet switches (up to four switches)
5	Main power switch
6	PC power supply
7	CPU/ Motherboard

8	Dual 250 GB SATA hard drives (third drive optional)
Top view of PC	
9	Video card
10	Network interface card
11	Data encryption key and USB ports

User Interface external connections

❖ *Note: the connectors not called out in the diagram have no connection*



For more information, refer to **Wiring diagram user interface/ PC** (on page 279).

1	Monitor connector panel
2	Convenience USB port

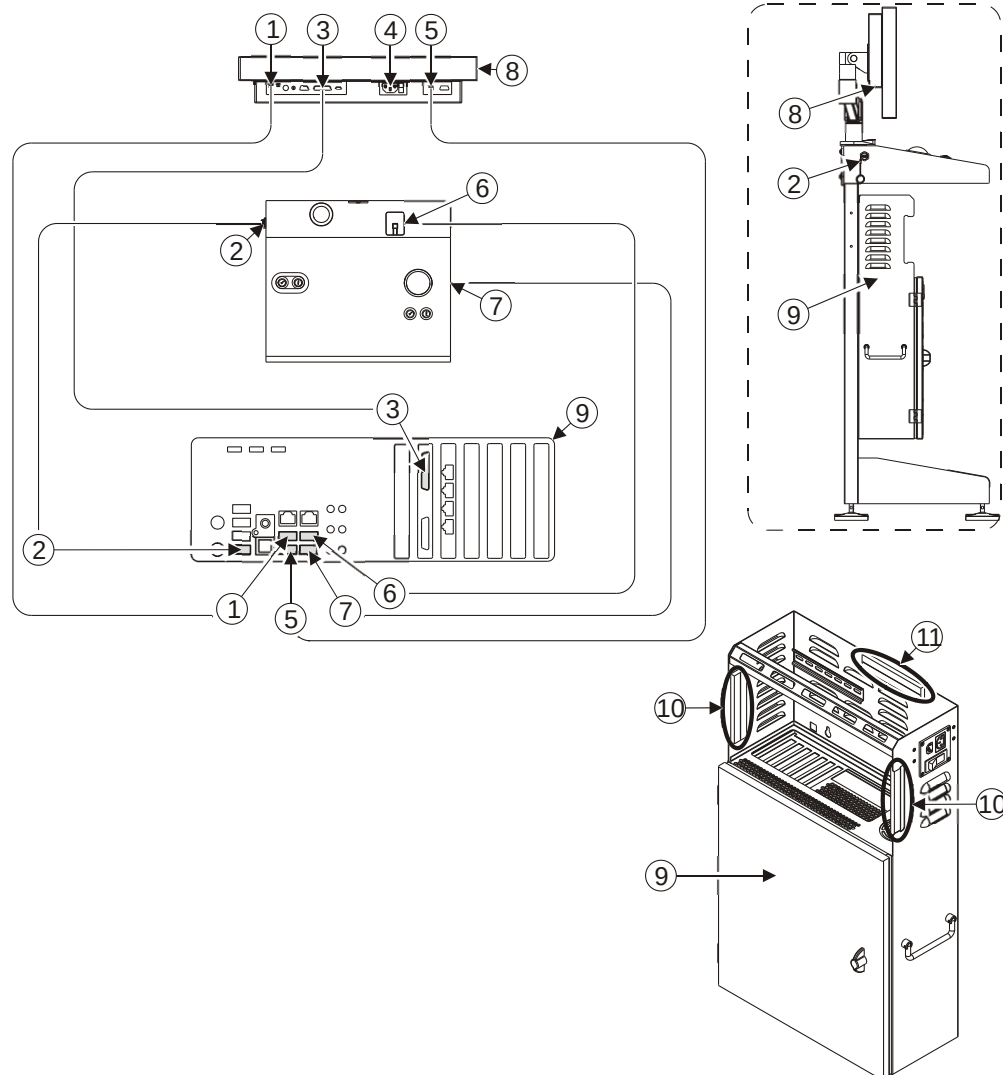
3	PC [inside the cabinet]

Monitor connector panel connectors	
4	Auxiliary USB connector
5	DVI input
6	AC power connector
7	Touch screen USB connector

PC connectors	
8	2 pin power connector for camera ethernet switch
9	2 pin power connector for PDN ethernet switch
10	Convenience USB port connector
11	Monitor auxiliary USB connector
12	Monitor touch screen USB connector
13	Trackball USB connector
14	Biometric device USB connector
15	DVI connector
16	Ethernet connector for camera ethernet switch (blue cable)
17	Ethernet connector for PDN ethernet switch (green cable)
18	Optional plant network connection
19	Optional remote user interface connection

Wiring diagram user interface/ PC

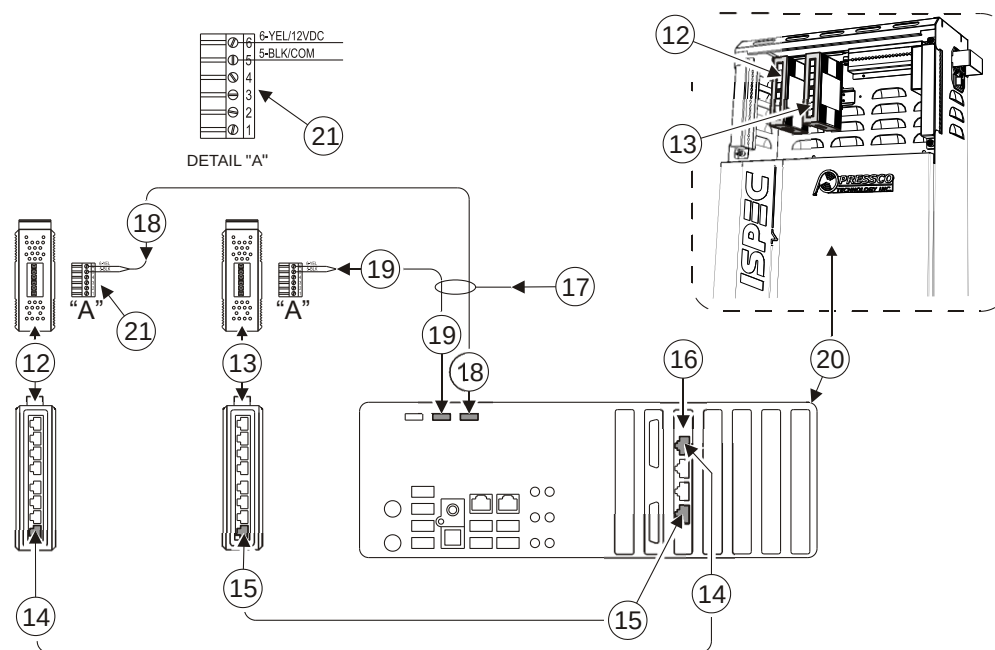
The following diagram shows the wire connections between the monitor, user interface, and PC.



1	Monitor auxiliary USB cable
2	Convenience USB port cable
3	DVI cable (included with monitor). (Remove DVI-VGA adapter if present)
4	AC power in for monitor
5	Touchscreen USB cable (for optional touchscreen monitor)
6	Optional Biometric device -USB cable ! Do not plug in until application software is installed
7	Trackball USB cable ! Do not plug in the PS/2 connector
8	View of monitor connector panel
9	PC. Connectors are inside cabinet.
10	Side cable entry locations

11	Cable entry. Route cables behind the PC mounting panel, through the cable entry at the back of the PC.

Wiring diagram ethernet switches

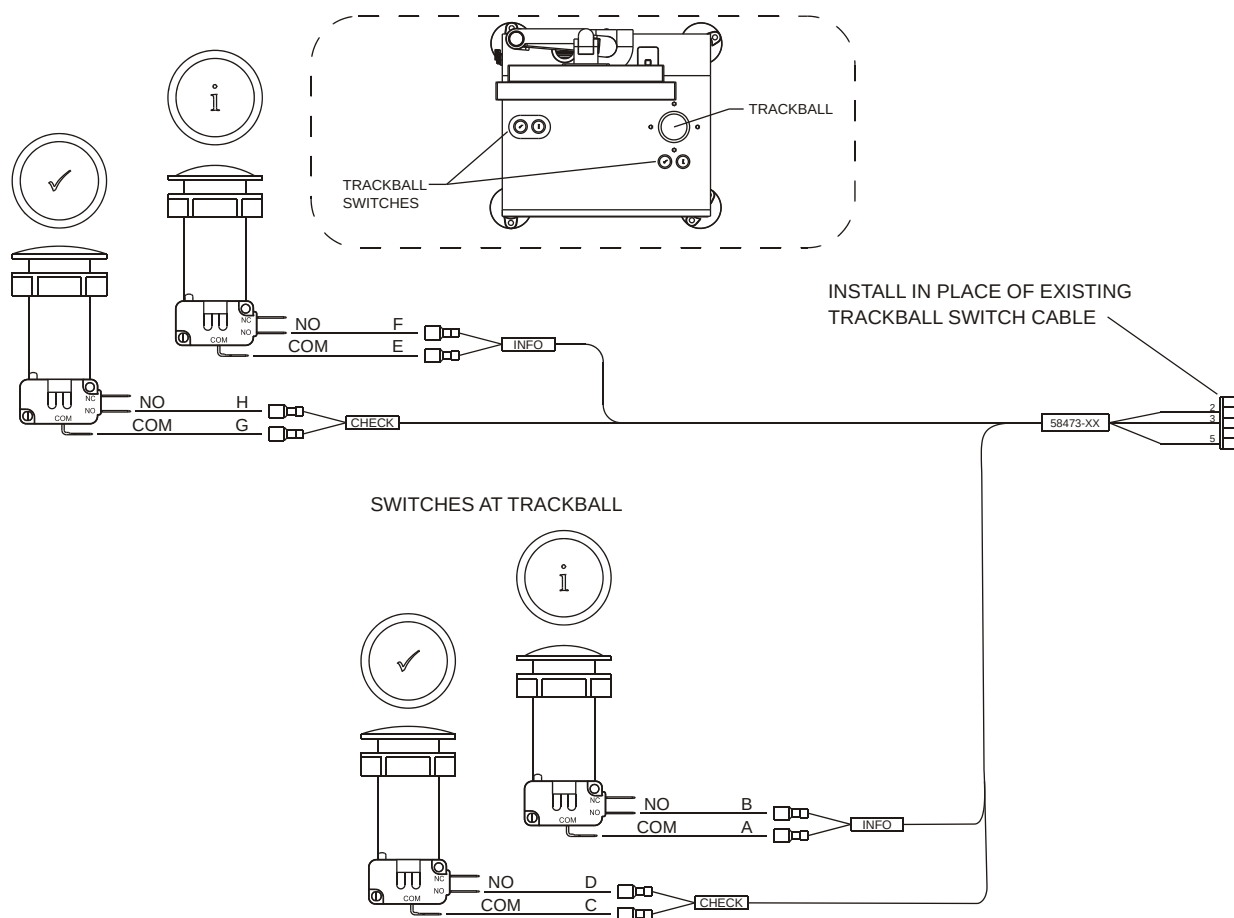


12	Ethernet switch for cameras [on left]
13	Ethernet switch for Pressco Device Network (PDN) [on right]
14	Blue ethernet cable
15	Green ethernet cable
16	Quad ethernet card
17	Two pin power connectors. Cables are included with PC.
18	Two pin power cable
19	Two pin power cable
20	PC
21	Detail "A" Ethernet switch power connection

❖ *Note: the Cat-6 ethernet cabling is divided into two groups. The green cabling goes to/from the cameras and lighting circuitry. The blue cabling goes to/from the part tracking circuitry.*

Wiring diagram trackball

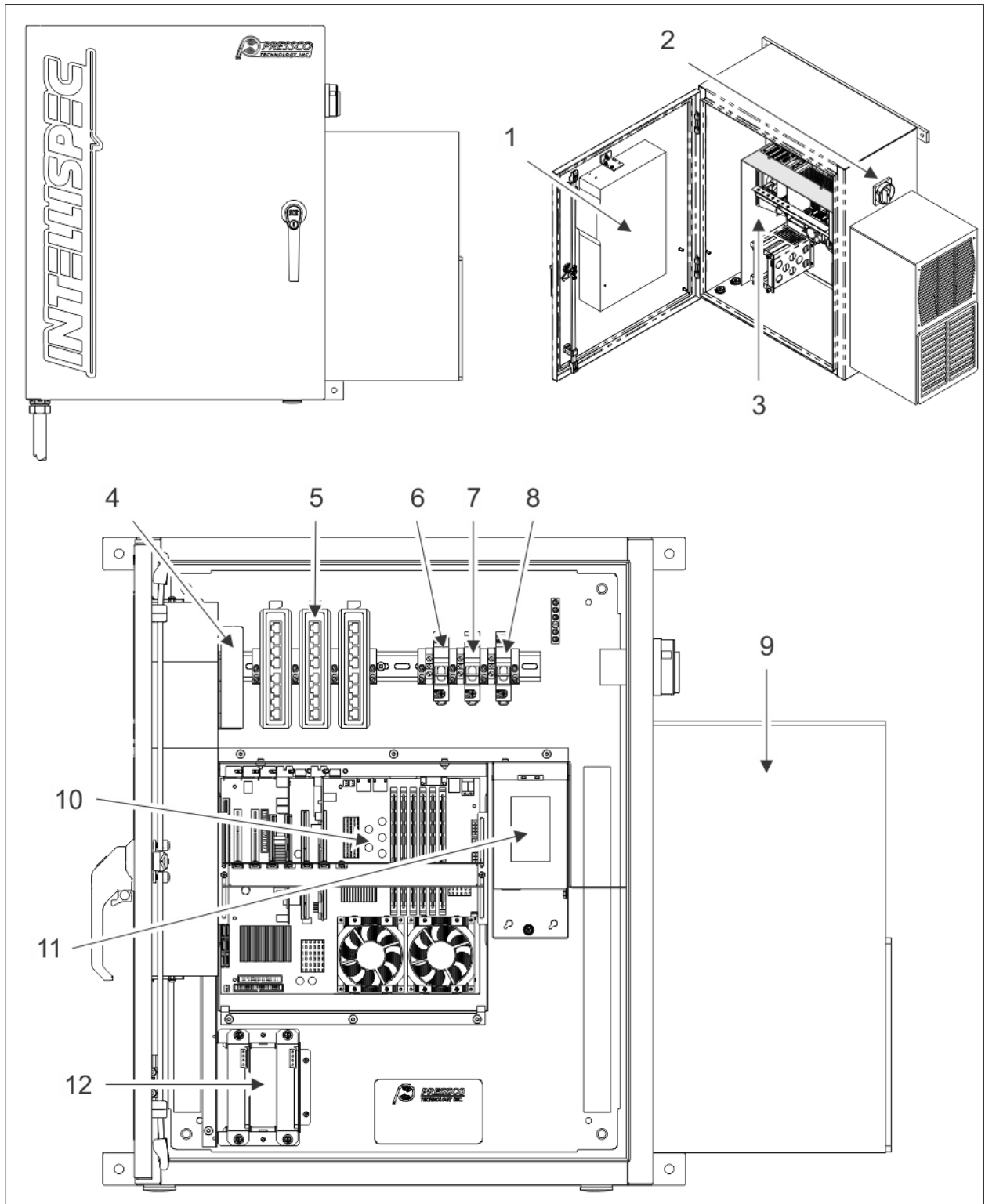
TRACKBALL SWITCH CONNECTIONS

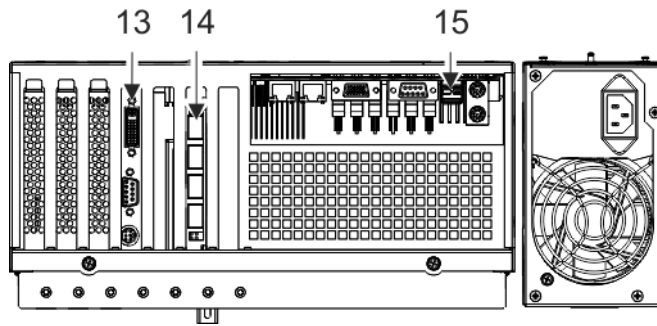


INTELLISPEC COMPUTER ENCLOSURE NEMA 4X - OPTIONAL

This optional computer enclosure is normally installed within the filling area of the plant, and meets the requirements for total wash-down environments. This unit can be mounted to a post or mounted directly to the conveyor using mounting hardware.

Computer Enclosure NEMA 4X components

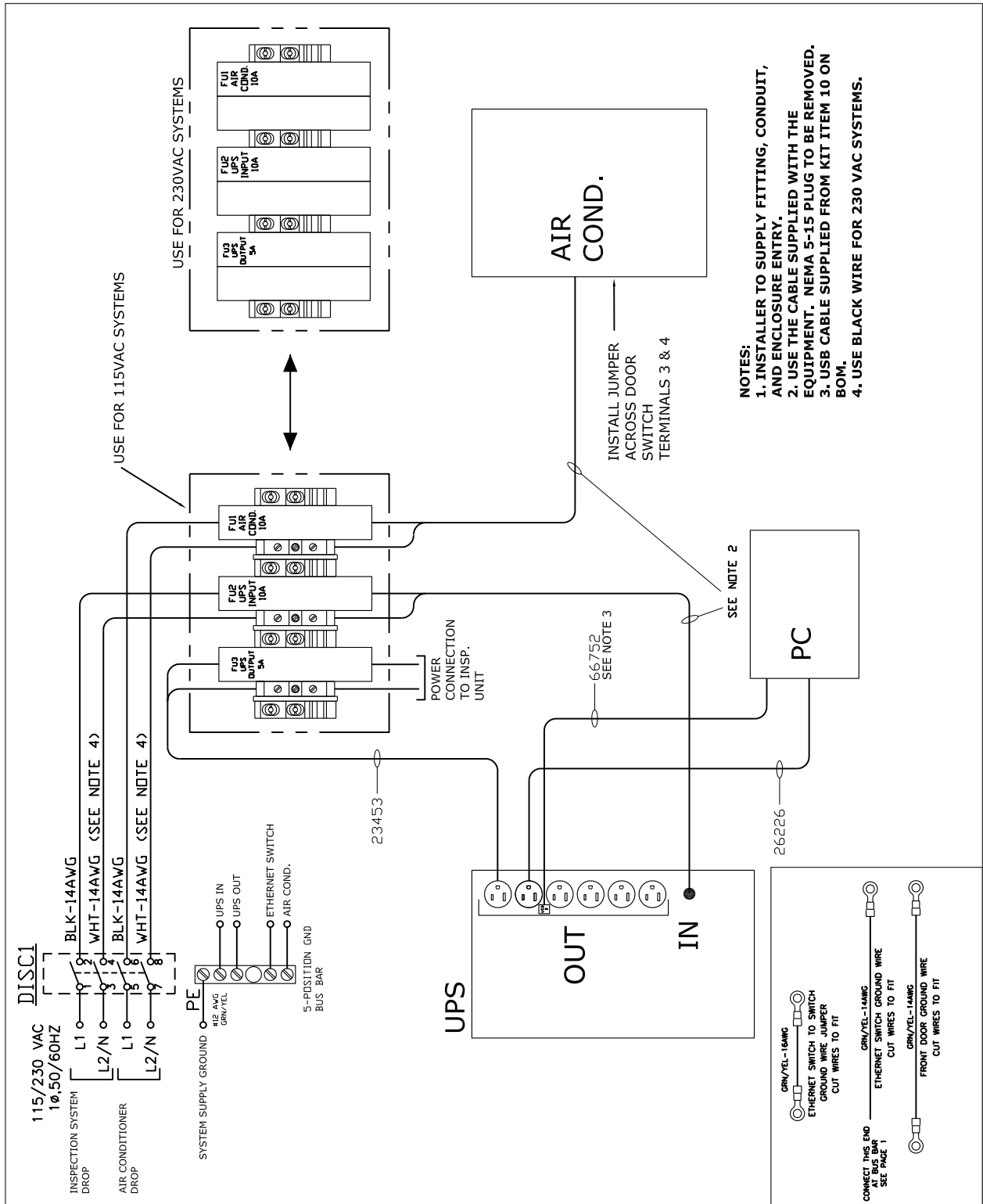




1	UPS (uninterruptible power supply)
2	Main power switch (DISC 1)
3	Computer
4	KVM extender
5	Ethernet switches (up to four switches)
6	Fuse block* (FU3) - UPS Output. 5A 600V Class CC Time Delay. Pressco part number 54279.
7	Fuse block* (FU2) - UPS Input. 10A 600V Class CC Time Delay. Pressco part number 53892.
8	Fuse block* (FU1) - Air Conditioner. 10A 600V Class CC Time Delay. Pressco part number 53892.
9	Air conditioning unit
10	CPU/ Motherboard
11	PC power supply and power switches
12	Dual 250 GB SATA hard drives (third drive optional)
Top view of PC	
13	Video card
14	Network interface card
15	Data encryption key and USB ports

❖ *Note: *FUSES: For 120V PC's, there is a terminal block for the neutral line. For 230V PC's, a two-pole fuse block is used. The 230V PC's use two each of the listed fuses in each fuse block.*

Wiring Diagram Computer Enclosure NEMA 4X

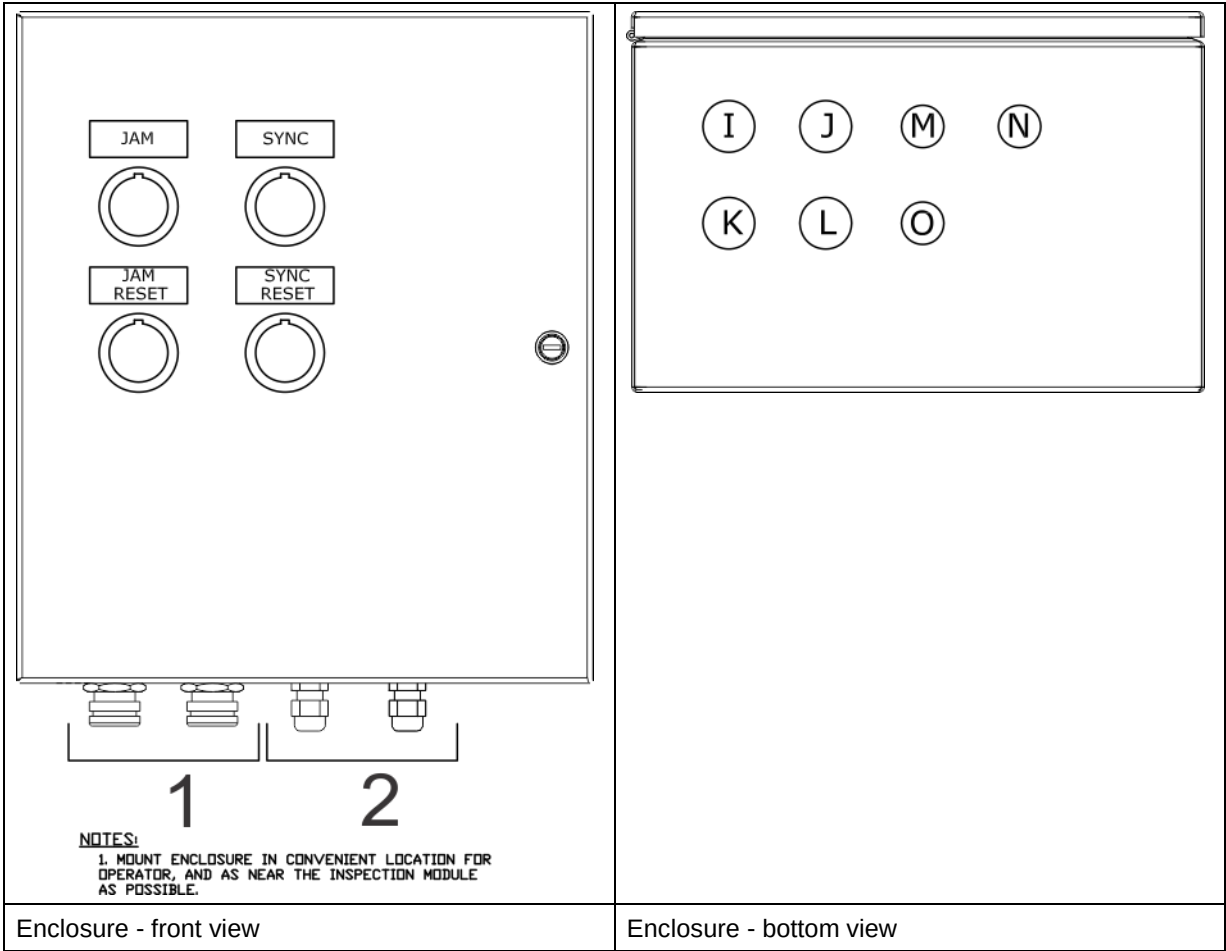


❖ **Note: FUSES:** For 120V PC's, there is a terminal block for the neutral line. For 230V PC's, a two-pole fuse block is used. See the fuse replacement information in **Computer Enclosure NEMA 4X components** (on page 282).

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 293) board and various sensors. It performs:

- jam detection
- correlation reset
- sending data to the customer Line Information System



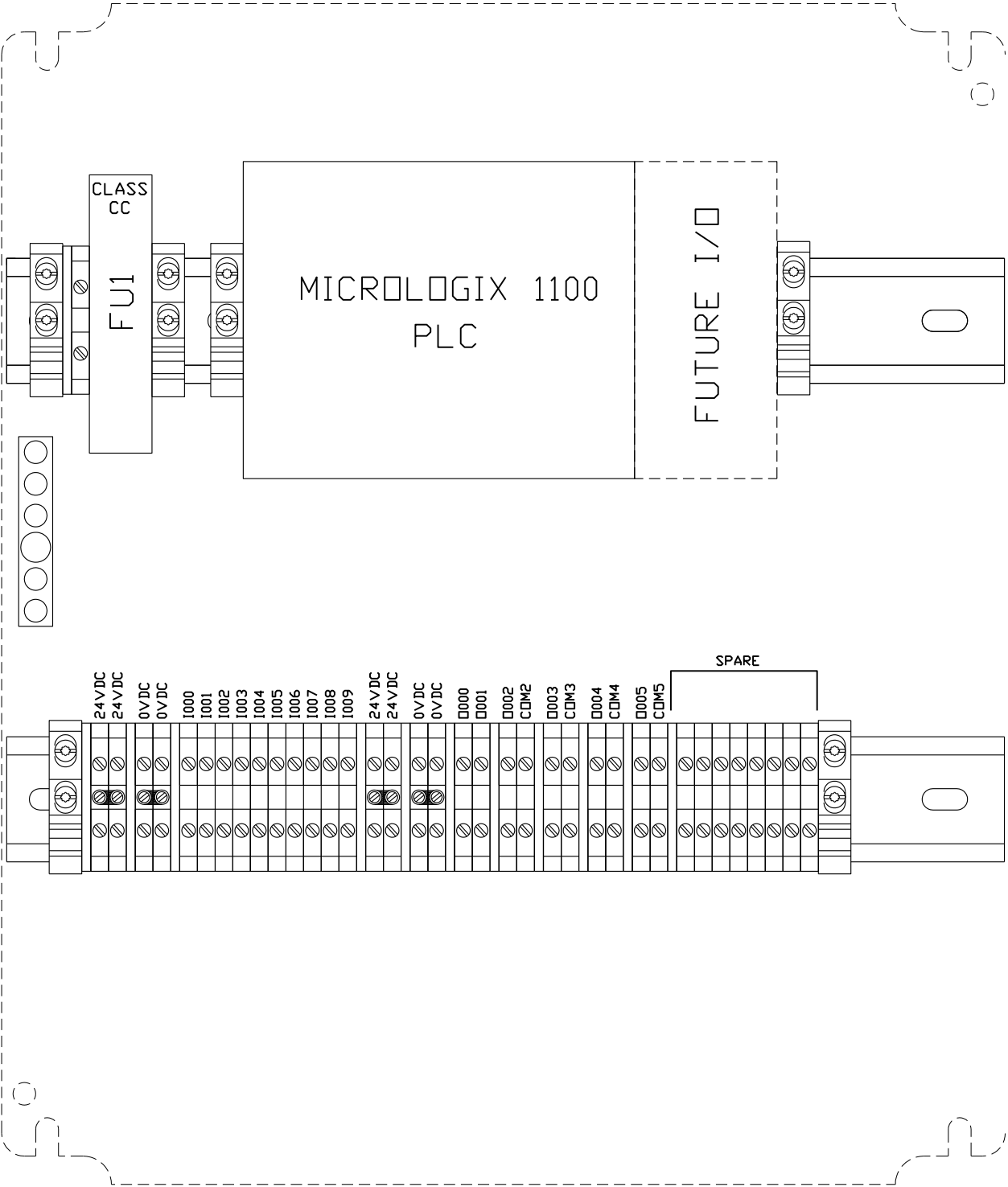
The connectors on the bottom of the box are routed as listed below	
1	Four (4) 3/4 inch sealtite fittings:
I	Extended I/O from inspection system
J	CAT6 from inspection system
K	120 VAC from inspection system
L	I/O from blow molder
2	Three (3) 1/2 inch cord grip fittings:
M	Sensor, capper exit (split)
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:

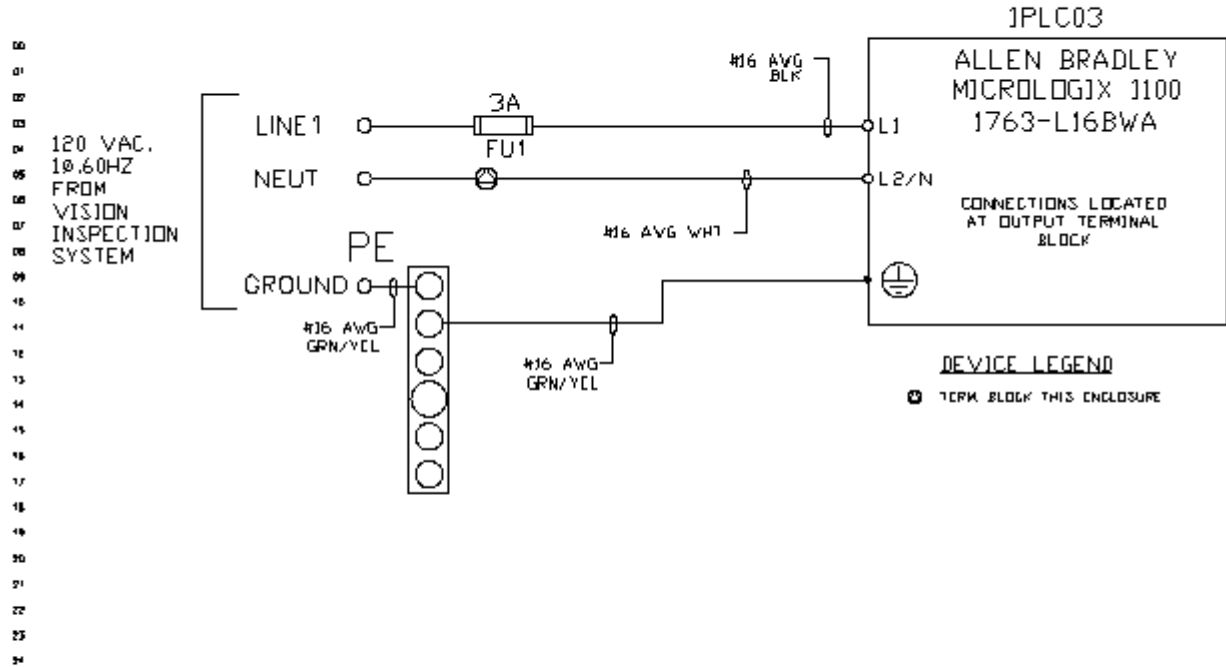
FU1	Fuse 1 - 3A 600V Class CC Time Delay. Pressco part number 54286



Electrical Diagram Enclosure PLC Interface - sheet 1

70576E sheet 1

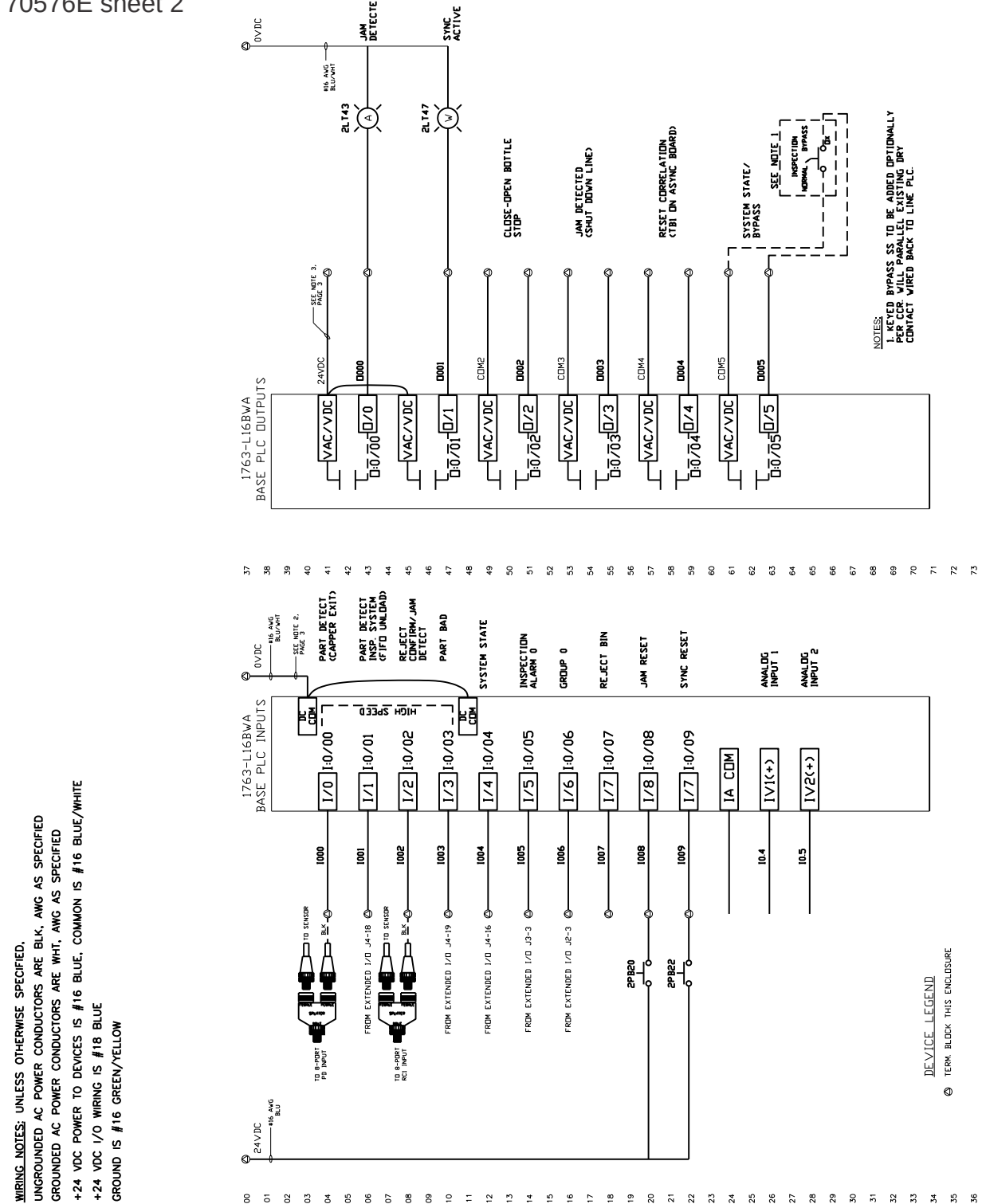
AC POWER SECTION



WIRING NOTES: UNLESS OTHERWISE SPECIFIED,
UNGROUND AC POWER CONDUCTORS ARE BLK, AND AS SPECIFIED
GROUND AC POWER CONDUCTORS ARE WHT, AND AS SPECIFIED
+24 VDC POWER TO DEVICES IS #18 BLUE, COMMON IS #18 BLU/WHT
+24 VDC I/O WIRING IS #18 BLUE
GROUND IS #18 GREEN/YELLOW

Electrical Diagram Enclosure PLC Interface - sheet 2

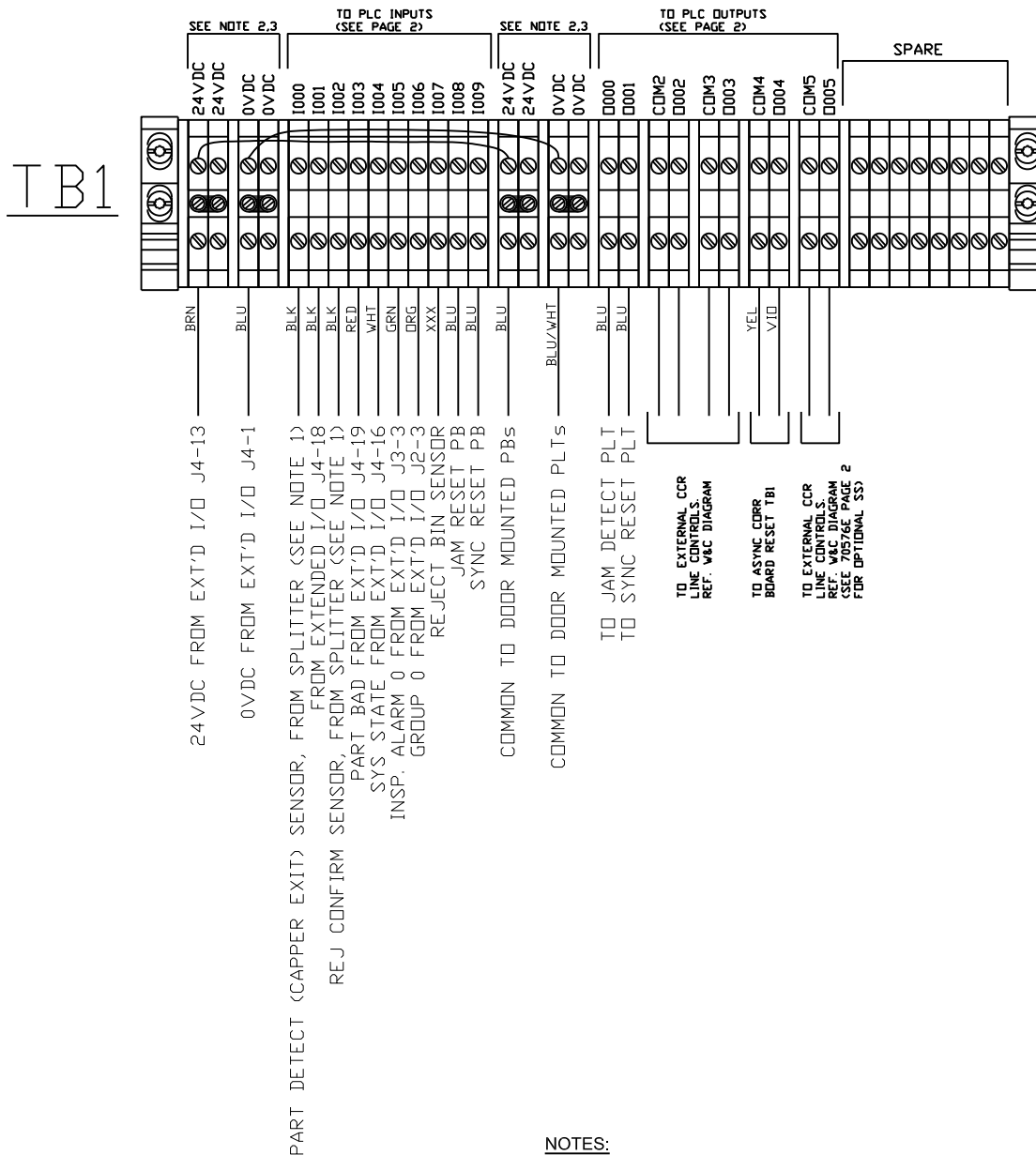
70576E sheet 2



Electrical Diagram Enclosure PLC Interface - sheet 3

70576E sheet 3

TERMINAL BLOCK WIRING DETAIL



WIRING NOTES: UNLESS OTHERWISE SPECIFIED,
 UNGROUNDED AC POWER CONDUCTORS ARE BLK, AWG AS SPECIFIED
 GROUNDED 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

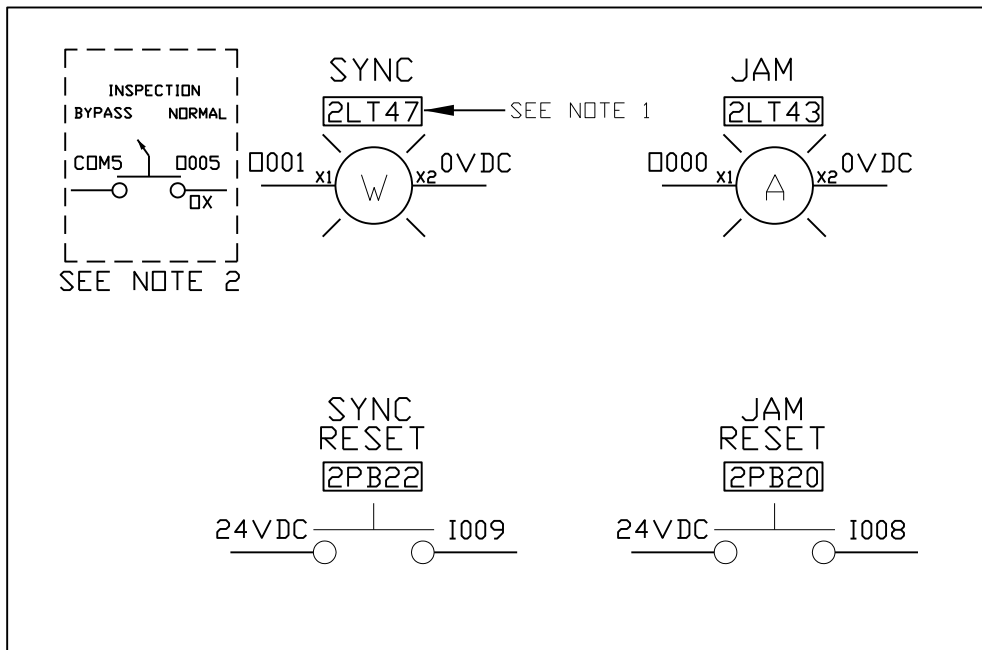
NOTES:

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 COM TERMINAL ON PLC AS SHOWN ON PAGE 2. THEN JUMPER TO SECOND DC COM 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

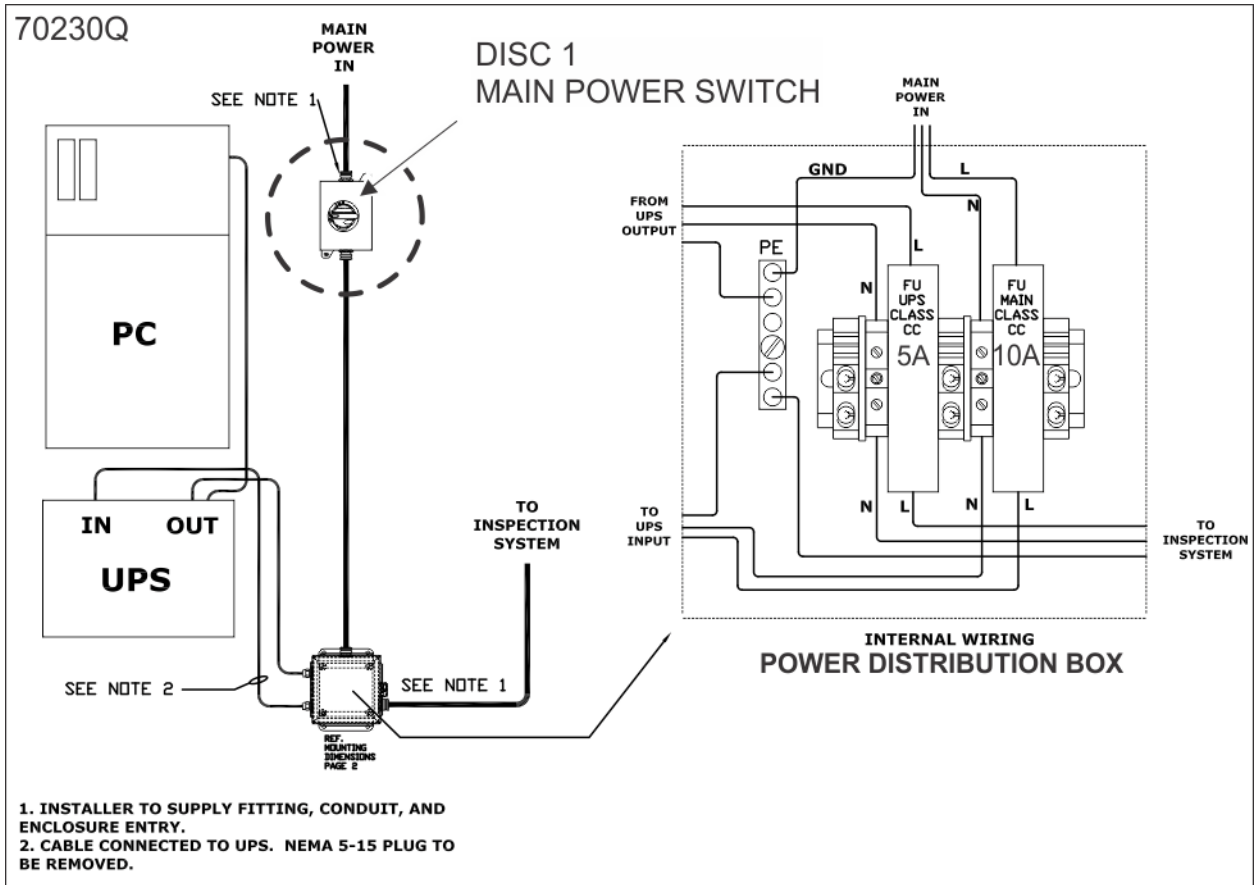
WIRING NOTES: UNLESS OTHERWISE SPECIFIED,

UNGROUND AC POWER CONDUCTORS ARE BLK, AWG AS SPECIFIED
 GROUNDED AC POWER CONDUCTORS ARE 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

COMPUTER INSTALLATION KIT

This kit contains the main power switch DISC 1, a power distribution box, and the appropriate wires. It allows you to correctly route the power to all FHCP 3X components, to provide UPS power protection, and to provide one power switch to control the entire system.

Wiring Diagram Computer Installation Kit and Power Distribution Box



Replaceable fuses include:

UPS fuse	5A 600V Class CC Time Delay. Pressco part number 54279.
Main fuse	10A 600V Class CC Time Delay. Pressco part number 53892.

Chapter 14

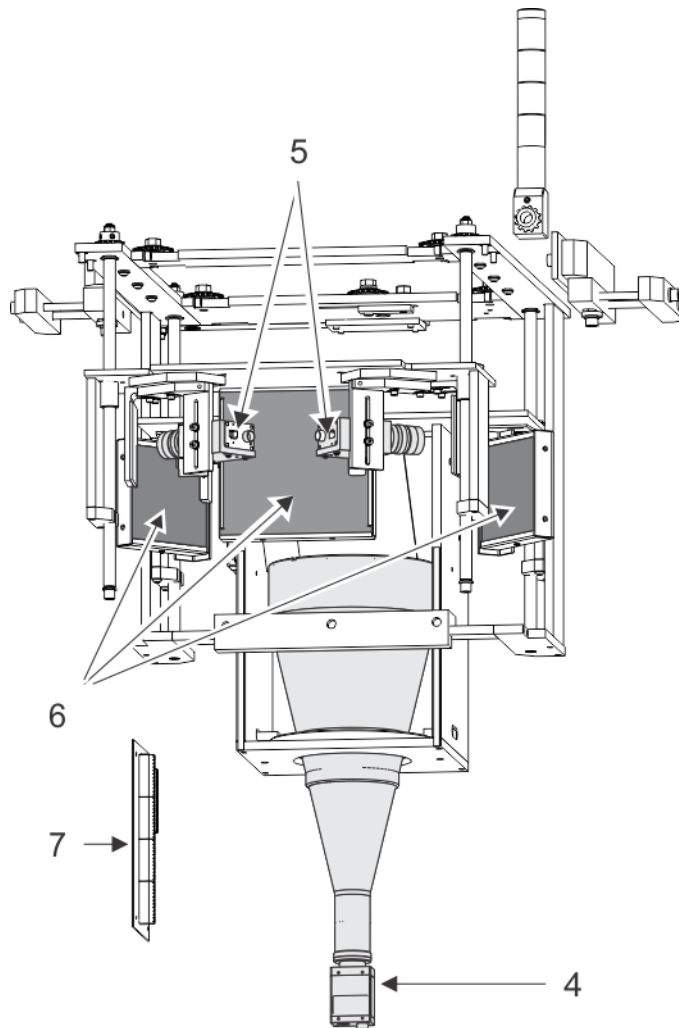
EXTENDED I/O

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 following illustration shows some internal components of the module.



4	One High Resolution black and white camera, 1,360 x 1024 pixels, for fill height inspection. This includes a telecentric lens.
5	Two Standard Resolution color cameras, 640 x 480 pixels, for cap inspection

6	Three solid-state lighting modules with programmable multiple zone and directional control.
7	Extended Discrete I/O board (optional). Extended I/O (on page 293)

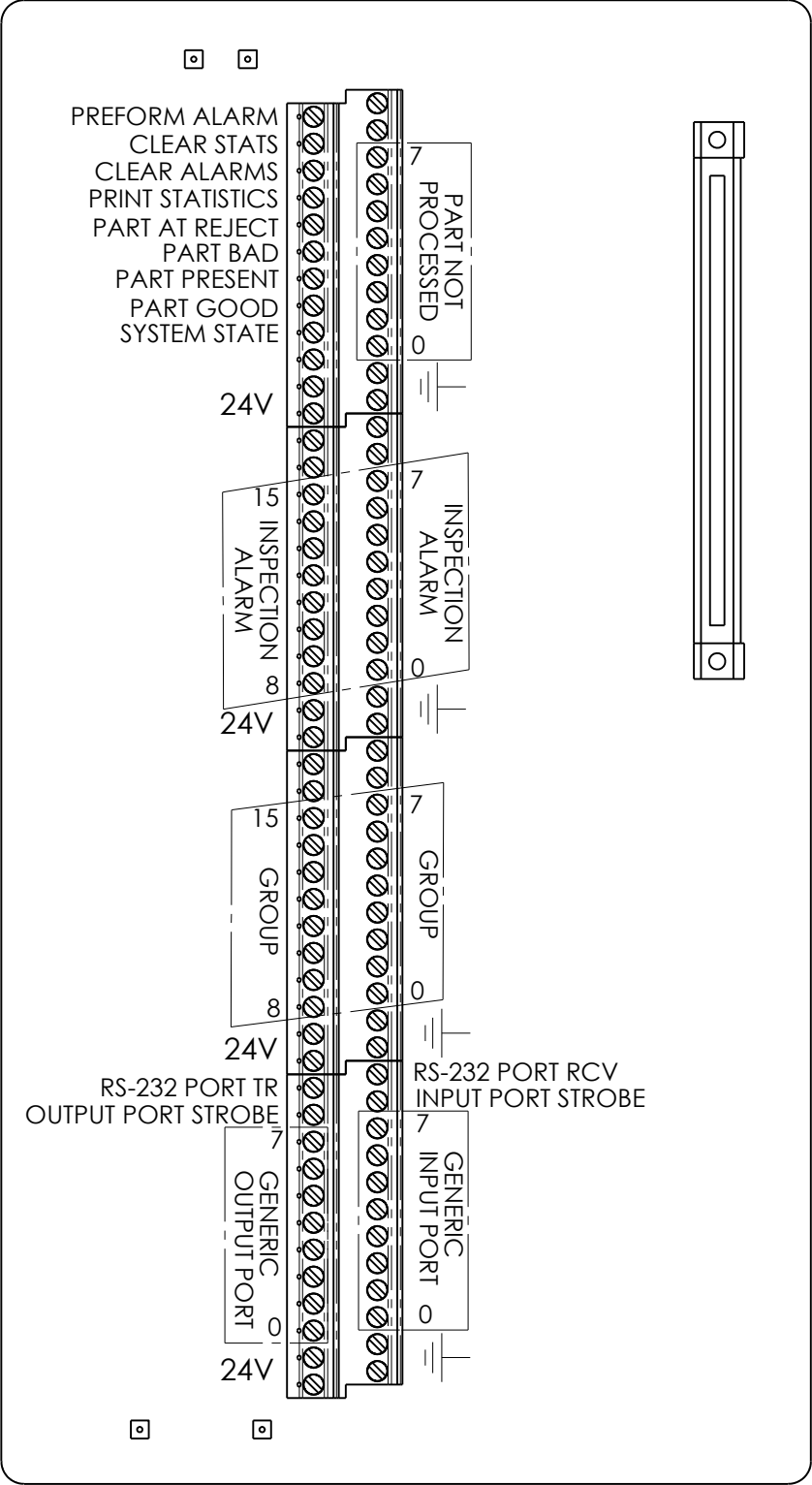
EXTENDED I/O BOARD

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 300).

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 299).

❖ *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 299).

*The signals marked with an asterisk must be enabled through **Extended I/O Configuration** (on page 300) 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 104)
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*	O	J4-17	D7	Pulses for 12 ms for each part declared good by the inspection
Part Bad*	O	J4-19	D5	Pulses for 12 ms for each part declared bad by the inspection
Part at Reject*	O	J4-20	D13	Pulses for 12 ms for each part the 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 60)
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	
Group 13	O	J2-20	D27	
Group 14	O	J2-21	D35	

Signal	I/O	Connector	Indicator LED	Comments/ Reference
Group 15	O	J2-22	D43	
Part Not Processed 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 1	O	J4-4	D113	
Part Not Processed 2	O	J4-5	D117	
Part Not Processed 3	O	J4-6	D121	
Part Not Processed 4	O	J4-7	D107	
Part Not Processed 5	O	J4-8	D111	
Part Not Processed 6	O	J4-9	D115	
Part Not Processed 7	O	J4-10	D119	
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 91) and Sensor Alarm Configuration (on page 95)
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 future use
Generic Input Port 1	I	J1-4	D50	
Generic Input Port 2	I	J1-5	D51	
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 future use
Generic Output Port 0	O	J1-15	D91	Reserved for future use
Generic Output Port 1	O	J1-16	D95	
Generic Output Port 2	O	J1-17	D101	
Generic Output Port 3	O	J1-18	D105	

Signal	I/O	Connector	Indicator LED	Comments/ Reference
Generic Output Port 4	O	J1-19	D89	
Generic Output Port 5	O	J1-20	D93	
Generic Output Port 6	O	J1-21	D99	
Generic Output Port 7	O	J1-22	D103	
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

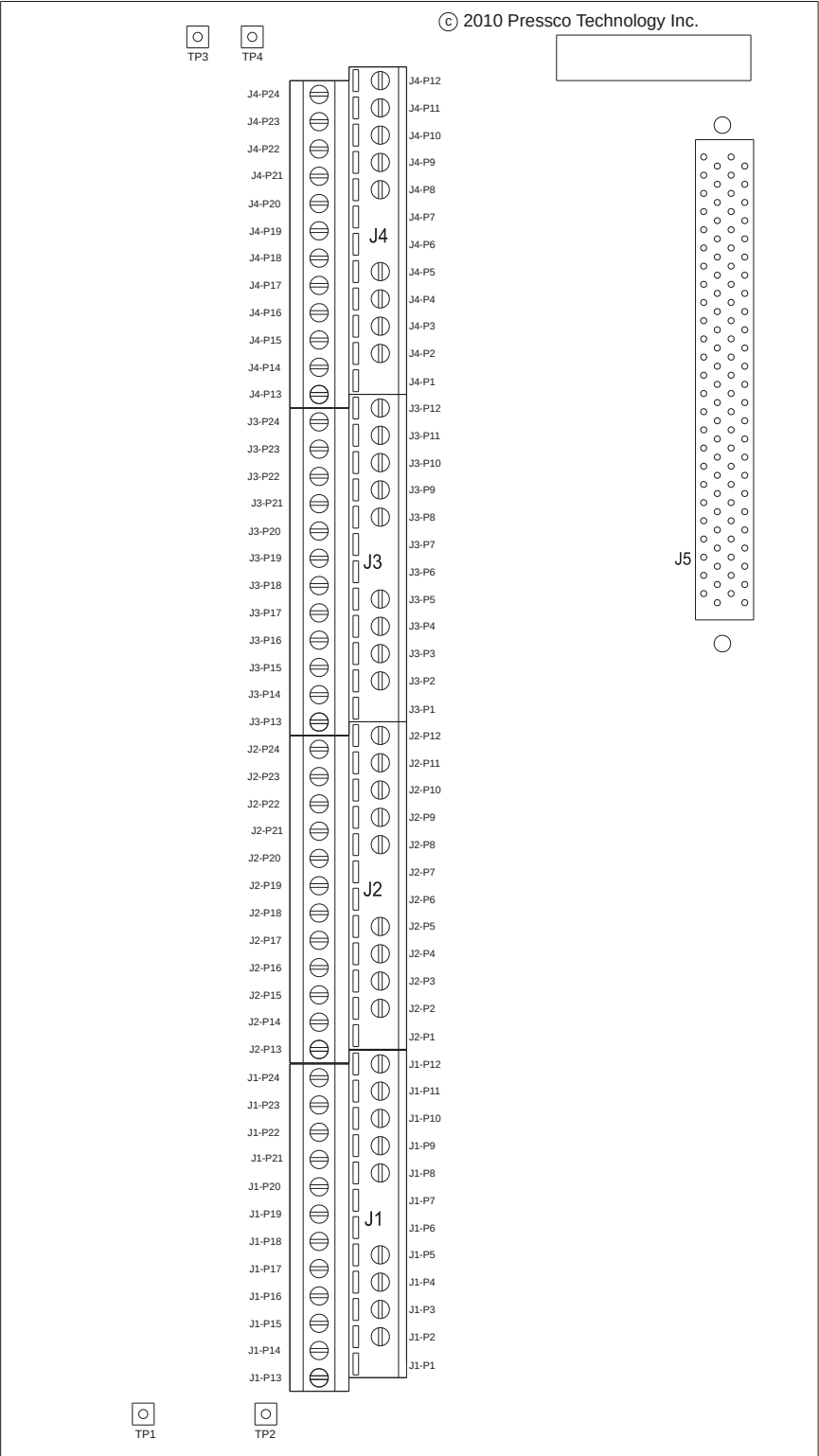
All Connectors

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



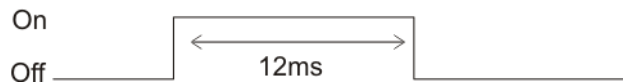
Extended I/O circuits

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.

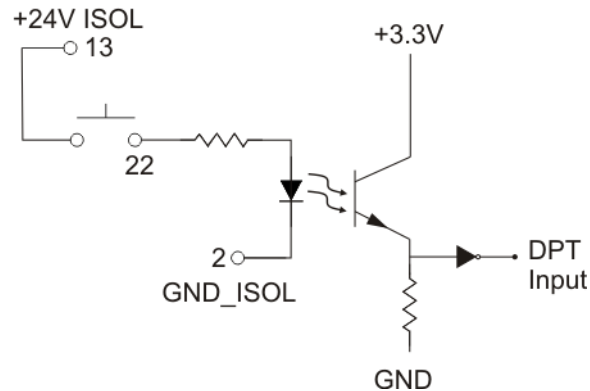
Default timing of pulsed output



The following illustration shows a typical circuit that can be used to clear alarms.

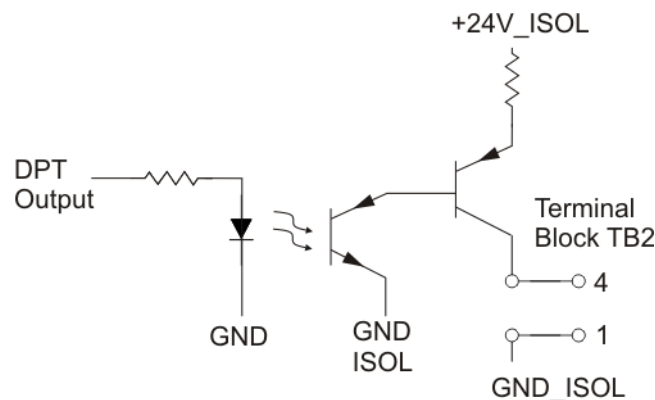
CLEAR ALARMS - INPUT

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

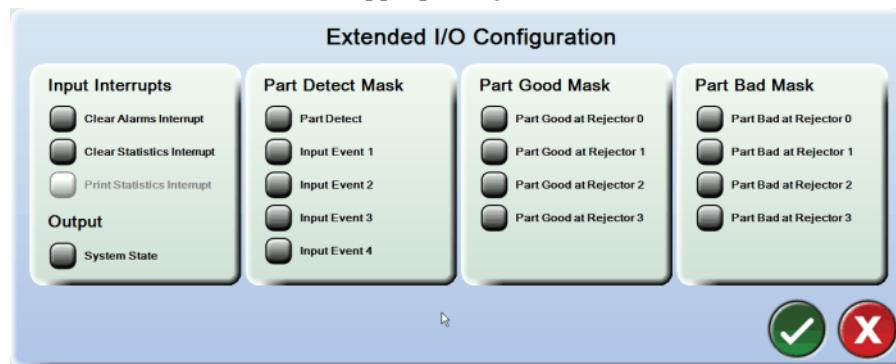
Through this menu you can enable input or output signals to either perform a function on the Intellispec system or allow you to monitor the production lane in your plant. These settings must be done for each Extended I/O board for each lane.

See also the sections about *Extended I/O* (see "*Extended I/O board*" on page 294) and *Extended I/O Signals* (on page 295).

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 104).

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 MASK

Choose which rejector(s) signal to activate the Part Good output on the Extended I/O board. After a part is inspected, the system determines whether the part is good or bad. As a good part passes the rejecter**, the system can trigger the Part Good output on the Extended I/O board. This is an OR function. Any enabled rejector that has a good part passing by will activate the extended I/O Part Good output.

PART BAD MASK

Choose which rejector(s) signal to activate the Part Bad output on the Extended I/O board. After a part is inspected, the system determines whether the part is good or bad. As a bad part passes the rejecter**, the system can trigger the Part Bad output on the Extended I/O board. This is an OR function. Any enabled rejector that has a bad part passing by will activate the extended I/O Part Bad output.

**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.

Chapter 15

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 335).

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 26)
	Lighting not set up correctly	Set up lighting Basic Adjust Lighting (on page 154) or Advanced Adjust Lighting (on page 155)
	Part tracker board not communicating	Restart the system (Restarting the Intellispec FHCP 3X System (on page 303))
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 303))

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 303).

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.

For an illustration of DISC 1 and the system components, see **Wiring Diagram Computer Installation Kit and Power Distribution Box** (on page 291).

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.

-
- ❖ *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 335))

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 24).

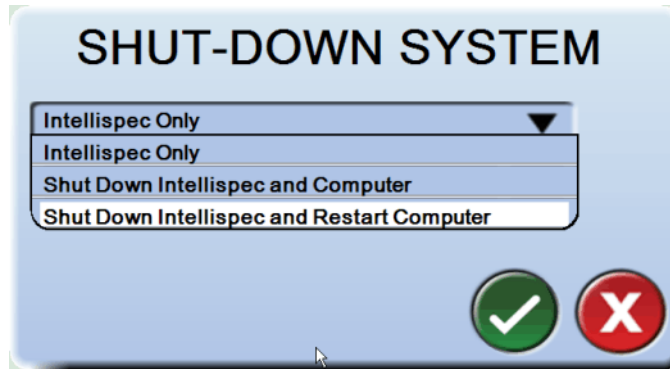


3. Click the Home button



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 32).
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 16

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		
NEMA 4X Vision Processor cabinet	Clean vision processor cabinet after wash-down, and/or as needed Cleaning the NEMA 4X Vision Processor cabinet (on page 311)		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. Cleaning the Vision Processor filter (on page 309) (Standalone computer). Or: Cleaning the NEMA 4X Vision Processor filter (on page 310) (NEMA 4X computer)			X
Plastic surfaces: Inspection tunnel windows	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution. Wipe dry. Cleaning Plastic Surfaces (on page 311)			X
Part Detect Sensor and Reflector	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution. Wipe dry. Cleaning the Part Detector (on page 313)	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. Cleaning the Camera Lens (on page 314)			
Glass surfaces: Mirrors	Clean with soft, clean, oil-free cloth dampened with lens cleaning solution. Cleaning Glass Surfaces (on page 314)			

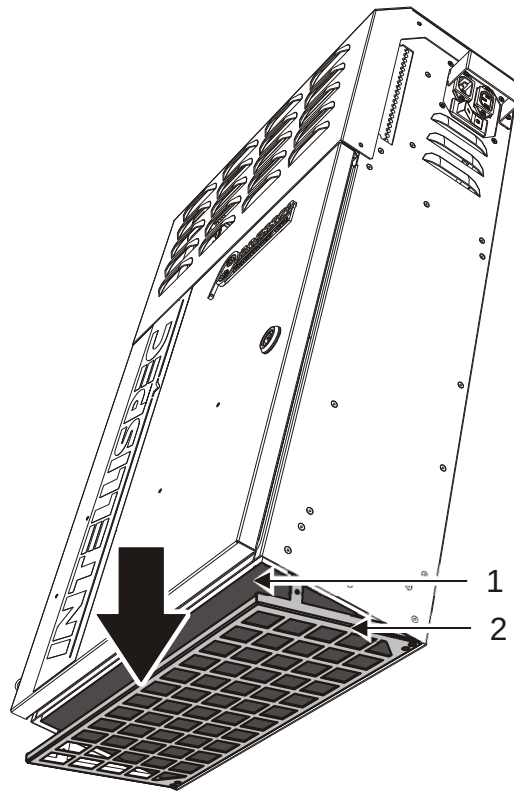
CLEANING THE VISION PROCESSOR FILTER

The filter for the vision processor should be cleaned once a month for best results. The filter is located underneath the user interface cabinet. Replace with a new filter when necessary.

❖ *Note: Frequency of cleaning will depend upon plant conditions*

To clean the filter:

1. With your fingers, pull down the front of the grate [item 2]. The grate is hinged, and opens wide enough to remove the filter.
2. Remove the filter [item 1] 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 underneath the user interface cabinet.
4. Push the grate closed.



1	Part number 66621 - filter for vision processor
2	Grate to hold filter in place

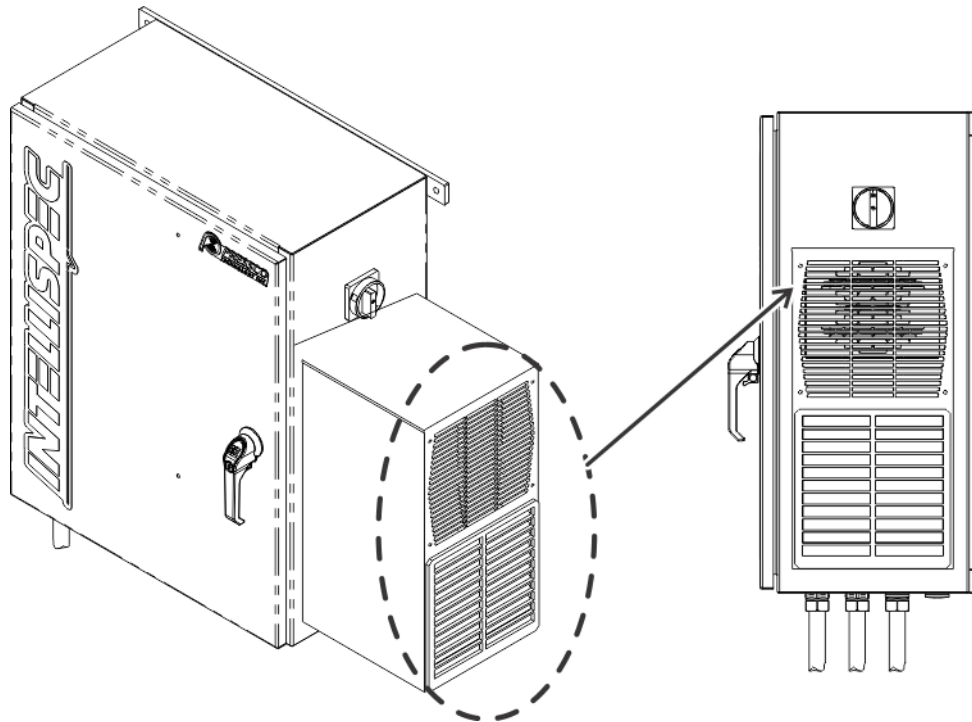
CLEANING THE NEMA 4X VISION PROCESSOR FILTER

If your system contains the NEMA 4X stainless steel vision processor, as shown below, then 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: Frequency of cleaning will depend upon 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.



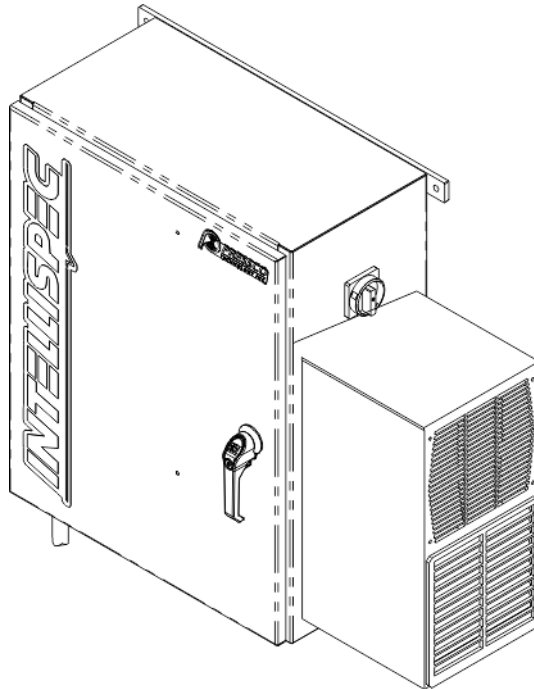
CLEANING THE NEMA 4X VISION PROCESSOR CABINET

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:

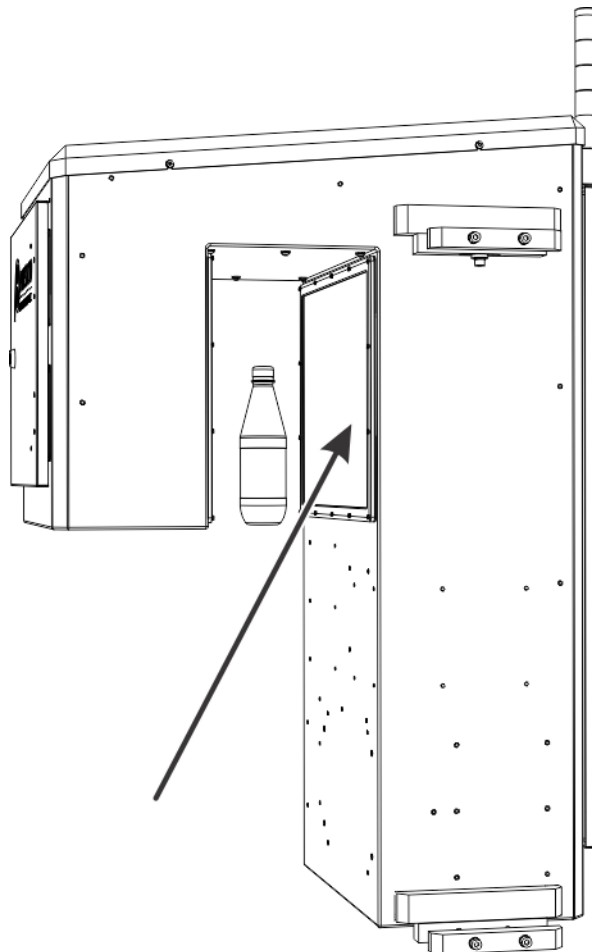
- Inspection tunnel windows (both sides)

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

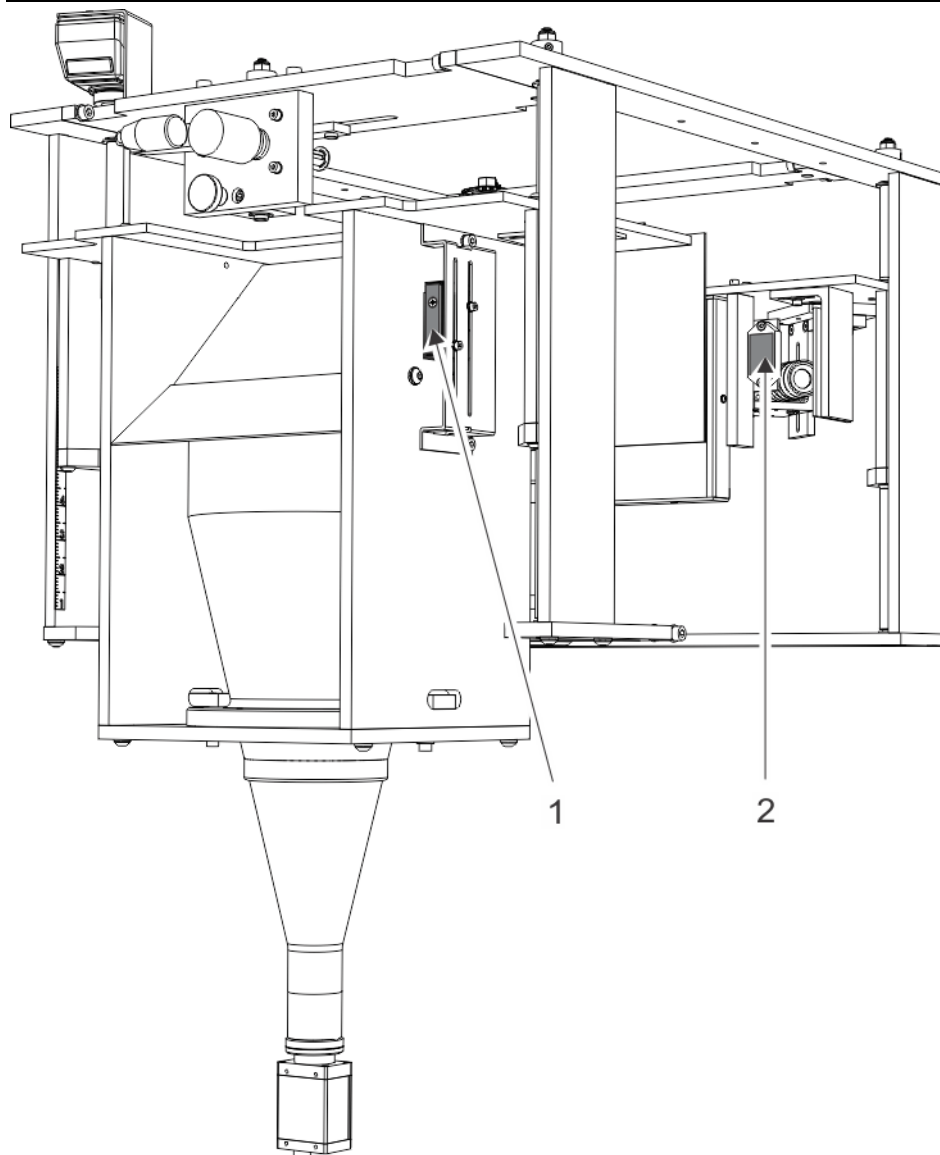
Under normal conditions, you do not need to clean these components, as they are inside the inspection module enclosure. Be sure to keep the inspection windows clean so that the optical components inside can properly detect parts and defects.

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 17

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 must be installed by a Pressco Service Engineer. **How to Contact Pressco** (on page 335)*

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 archive for this data is the Defect Database which is a SQLite version 3.6 database. The purpose of Defect Database Tool is to provide a user interface to support such activities as searching, viewing and reporting defect information. In addition, the tool provides support for database management such as database backup, restore, and export operations.

This information is valid as of 5.0.455 software.

Note the following about the Defect Database:

- Defect data from each lane is stored within a single database. That is, if you have more than one lane, you must enable the Defect Database for each lane. A separate database will be created for each lane.
- Defect images are not stored within the database. When a database is restored, only data is restored - not images. However, corresponding images saved by Intellispec to the hard drive are viewable via the **Image Viewer** (on page 322).

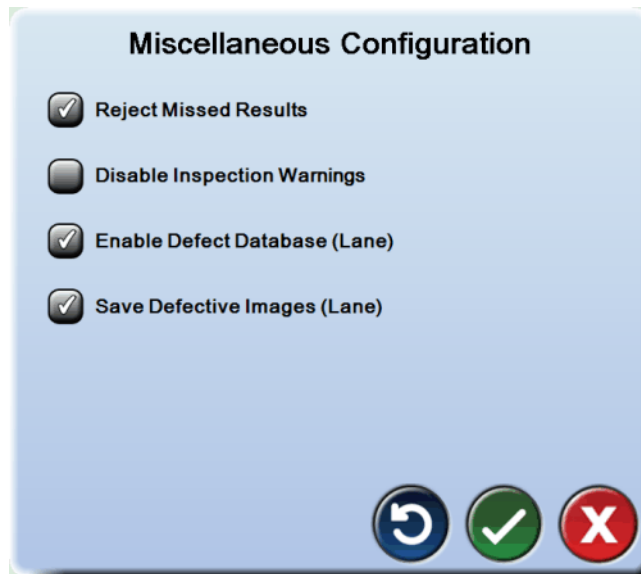
To enable the Defect Database Tool:

1. Go to Lane Overview mode by clicking one of the Lane buttons.





2. Click the Tools button, then Lane Setup, then Miscellaneous Configuration. The Miscellaneous Configuration menu is displayed.



3. Check the Enable Defect Database box.
4. Check the Save Defect Images box if you wish to save part images along with defect data.

To run the Defect Database Tool:



1. From Lane Overview mode, click the Favorites button.
2. Choose Defect Database from the menu. A message notifies you of a possible delay if the database has grown large.



3. Click OK to continue. The tool opens with the Search tab displayed. These menus are described later in this section.

Search Search Results Reports Maintenance Help

Lane: 1 Machine Part 1 ID:

Part Program: ALL Machine Part 2 ID:

Sensor: ALL Machine Part 3 ID:

Inspection: ALL Machine Part 4 ID:

Inspection Type: ALL

Status: ALL

Start Time: 5/25/2011 12:00 AM

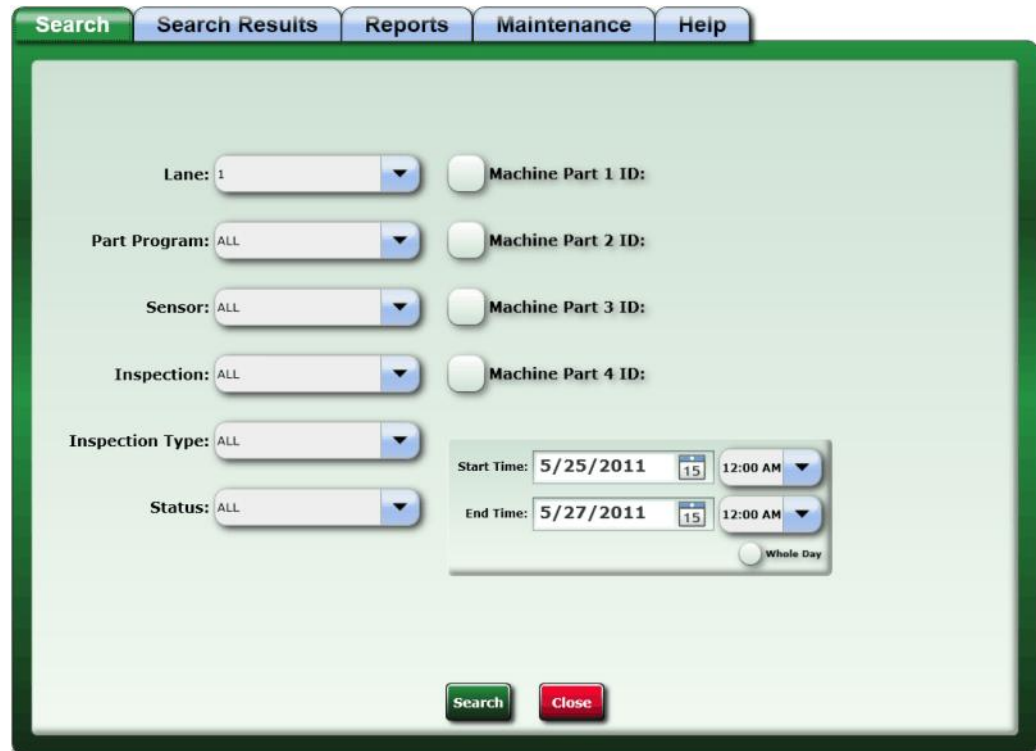
End Time: 5/27/2011 12:00 AM

Whole Day

Search Close

SEARCH

The Search tab provides controls for searching the database. The search results may be limited by specific filter values. The primary filters include the Lane, Part Program, Sensor, Inspection, Inspection Type, and Status (of inspection). Secondary filters include machine part correlation names. A date/time range picker control is also available to limit data by a date range.



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.

Primary filters

Values for each of the primary filters may be selected from a corresponding drop-down menu. The values within the drop-down correspond to values saved in the database for that specific lane. For example, an inspection with data saved in the database that is named “Radial Edge” would appear in the Inspection’s drop-down menu. The default value for all the primary filters is “ALL” meaning that all possible values for that parameter will be included in the search results. For example, selecting “ALL” for Inspections will include defect data for all inspections for which there have been failed inspections.

Status filters

The Status filter refers to the result status of the inspection. When "All" is selected, all failed inspections are shown.

Secondary filters

The Secondary filters are for machine parts. By default, filtering by machine part names is disabled. To enable, select the appropriate machine part check box. A numeric spinner will display. Pressing the up/down arrows changes the numeric value within a range from 1 to 512. Note that the machine part name displayed, in the future, will correspond to the name configured within Intellispec; for example, if machine part 1 was named “Cavity” then “Cavity ID” appears adjacent to the checkbox. Presently, the machine part name appears as a generic name such as “Machine Part 1”. Up to four machine parts can be selected as secondary filters.

Date/Time Range Picker

The Date/Time range picker allows you to limit search results by a date range. By default, the start time is set to midnight of the previous day and the end time is set to midnight of the next day. The dates and times correspond to the standard time of whatever timezone is used by the system. This was done to prevent reporting errors should the system collect information during a change to or from daylight savings time.

To change start or end date:

Select the calendar icon. A calendar will display allowing you to select a desired date.

The screenshot shows the Intellispec search interface. At the top are tabs: Search, Search Results, Reports, and Maintenance. The Search Results tab is active. Below the tabs are several filter sections:

- Lane:** A dropdown menu with '1' selected.
- Part Program:** A dropdown menu with 'ALL' selected.
- Sensor:** A dropdown menu with 'ALL' selected.
- Inspection:** A dropdown menu with 'ALL' selected.
- Inspection Type:** A dropdown menu with 'ALL' selected.
- Status:** A dropdown menu with 'ALL' selected.

Below these filters are four checkboxes for machine parts, each with a numeric spinner:

- ☒ Machine Part 1 ID: [1]
- ☐ Machine Part 2 ID: [1]
- ☐ Machine Part 3 ID: [1]
- ☐ Machine Part 4 ID: [1]

At the bottom right, there is a date/time range picker:

- Start Time:** 5/25/2011 [15] 12:00 AM
- End Time:** 5/27/2011 [15] 12:00 AM
- ☐ Whole Day

At the bottom are two buttons: Search and Close.

Overlaid on the right side of the interface is a calendar for May 2011. The calendar shows days of the week (Su, Mo, Tu, We, Th, Fr, Sa) and dates. The date 25 is highlighted in blue, and the date 26 is highlighted in grey.

To select start or end times:

Select the appropriate drop-down and then the appropriate time. Time is presented in half hour increments.

- ❖ *Note: the start date/time must be a value prior to the end date/time. Otherwise, it is tagged as an error and it must be corrected as shown below.*

The screenshot shows the 'Search Results' tab of a software interface. At the top, there are five tabs: 'Search', 'Search Results', 'Reports', 'Maintenance', and 'Help'. Below the tabs, a message reads: 'Please correct the errors highlighted in red:'. The form contains several input fields: 'Lane: 1', 'Part Program: ALL', 'Sensor: ALL', 'Inspection: ALL', 'Inspection Type: ALL', and 'Status: ALL'. To the right of these are four 'Machine Part ID' fields, each with a green 'X' icon and a '14' label. The 'Start Time' and 'End Time' fields are highlighted with a red box. The 'Start Time' is '5/25/2011 12:00 AM' and the 'End Time' is '5/24/2011 12:00 AM'. A red error message below the box states: 'Start Time must occur before End Time!'. At the bottom, there are 'Search' and 'Close' buttons.

SEARCH RESULTS

After performing a search, the Search Results tab is automatically selected. Defect data returned as search results are 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, and so on). To view various columns and rows of data for a particular page use scroll bars to the right and bottom of grid.

Depending on the search criteria multiple pages of data may be returned. At the bottom left of the grid is the page size and total records (rows) returned from the database. The page size specifies the maximum number of rows to display per page. The page size is set to 50 by default but may be adjusted to any desired size; the greater the page size the fewer the pages to navigate. The bottom right of the grid is a navigation control that allows you to navigate to various pages; it includes previous, next, jump to first page, and jump to last page navigation.

Search

Search Results

Reports

Maintenance

Help

Image	Part ID	Status	Created On	Part Program Name	Part Program ID	Lane	Sensor	Inspection	Inspect ID	InspectionType	Mac
	20253	4	5/25/2011 7:45:33 AM	BNS EL	54	1	Seal	Ovality Inspection	1110	ITD_MeasurementAlgorithm	2
	20253	4	5/25/2011 7:45:33 AM	BNS EL	54	1	Seal	Ovality Inspection	1110	ITD_MeasurementAlgorithm	2
	20254	4	5/25/2011 7:45:34 AM	BNS EL	54	1	IMAS5 Base2	Mass	1111	ITD_MassCompareAlgorithm	3
	20259	4	5/25/2011 7:45:34 AM	BNS EL	54	1	Neck	Upper Neck Inspection	1096	ITD_ContrasAlgorithm	8
	20259	4	5/25/2011 7:45:34 AM	BNS EL	54	1	Neck	Lower Neck Inspection	1092	ITD_ContrasAlgorithm	8
	20259	4	5/25/2011 7:45:34 AM	BNS EL	54	1	Seal	Seal Surface Inspection	1106	ITD_ContrasAlgorithm	8
	20259	4	5/25/2011 7:45:34 AM	BNS EL	54	1	Seal	Ovality Inspection	1110	ITD_MeasurementAlgorithm	8
	20259	4	5/25/2011 7:45:34 AM	BNS EL	54	1	Seal	Ovality Inspection	1110	ITD_MeasurementAlgorithm	8
	20276	4	5/25/2011 7:45:37 AM	BNS EL	54	1	Neck	Lower Neck Inspection	1092	ITD_ContrasAlgorithm	1
	20277	4	5/25/2011 7:45:37 AM	BNS EL	54	1	Neck	Upper Neck Inspection	1096	ITD_ContrasAlgorithm	2
	20277	4	5/25/2011 7:45:37 AM	BNS EL	54	1	Neck	Lower Neck Inspection	1092	ITD_ContrasAlgorithm	2
	20277	4	5/25/2011 7:45:37 AM	BNS EL	54	1	Seal	Seal Surface Inspection	1106	ITD_ContrasAlgorithm	2
	20277	4	5/25/2011 7:45:37 AM	BNS EL	54	1	Seal	Ovality Inspection	1110	ITD_MeasurementAlgorithm	2
	20277	4	5/25/2011 7:45:37 AM	BNS EL	54	1	Seal	Ovality Inspection	1110	ITD_MeasurementAlgorithm	2
	20280	4	5/25/2011 7:45:38 AM	BNS EL	54	1	Base	Outer Base Inspection	1060	ITD_ContrasAlgorithm	5
	20280	4	5/25/2011 7:45:38 AM	BNS EL	54	1	Base	Spoke Defect Inspection	1062	ITD_ContrasAlgorithm	5
	20280	4	5/25/2011 7:45:38 AM	BNS EL	54	1	Base	Orientation Pattern Match	1066	ITD_PMOrient	5

Page Size: 50

Total: 46454

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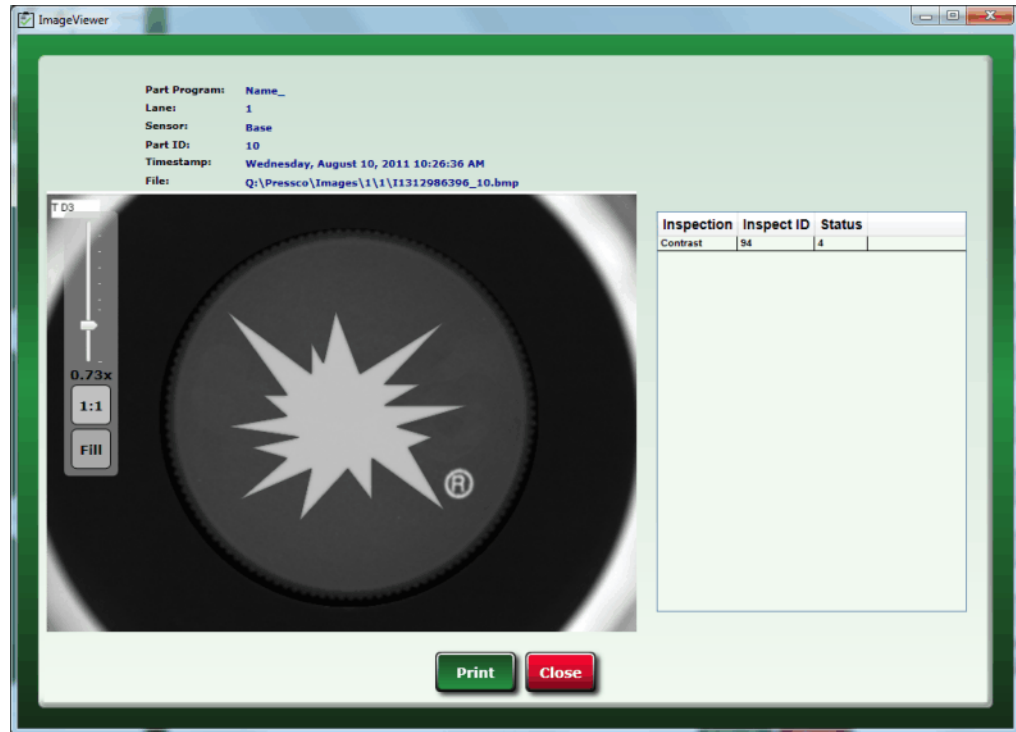
>>

Export

Close

Image Viewer

The first column on the **Search Results** (on page 320) grid is the Image column which has a View button. Selecting the **View** button opens the Image Viewer loaded with the corresponding inspection name for that row. The image viewer displays the image of the defective part if one exists; note that image capture can be enabled or disabled from the **Lane Overview user interface** (see "**Defect Database Tool (option)**" on page 315). The inspection associated with defective part is displayed to the right of the image. The Image Viewer supports both pan and zoom capabilities. To zoom in, move the slider up. To zoom out, move the slider down. To pan, drag the cursor in the image.



REPORTS

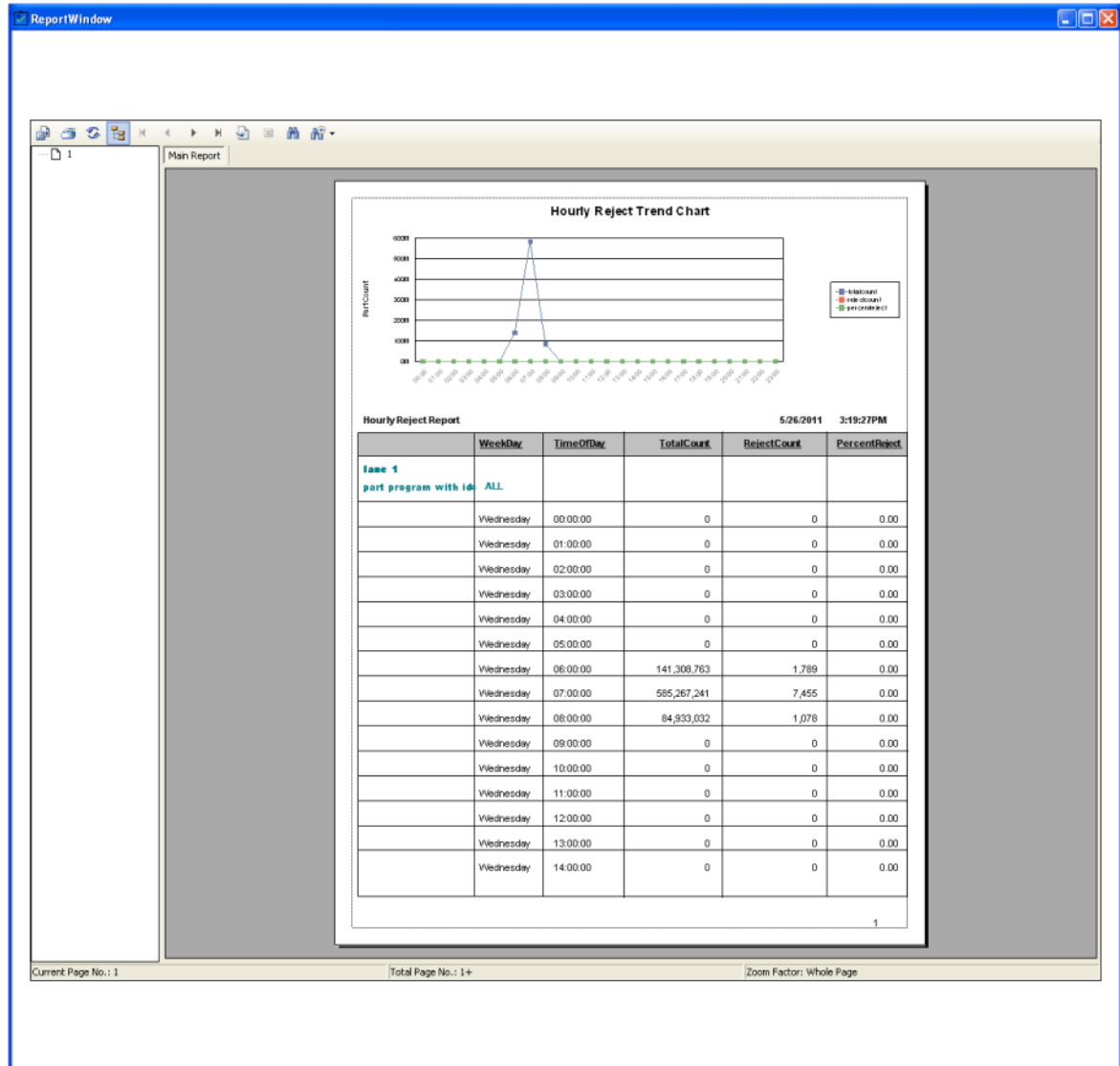
The Reports tab provides controls for generating reports based on defect data. Select the type of report from the "Select Report" drop-down menu. Choices include:

- Hourly Reject Report
- Detail Hourly Reject Report
- Daily Reject Report.

A date/time range picker is provided to limit the report to a specific period.

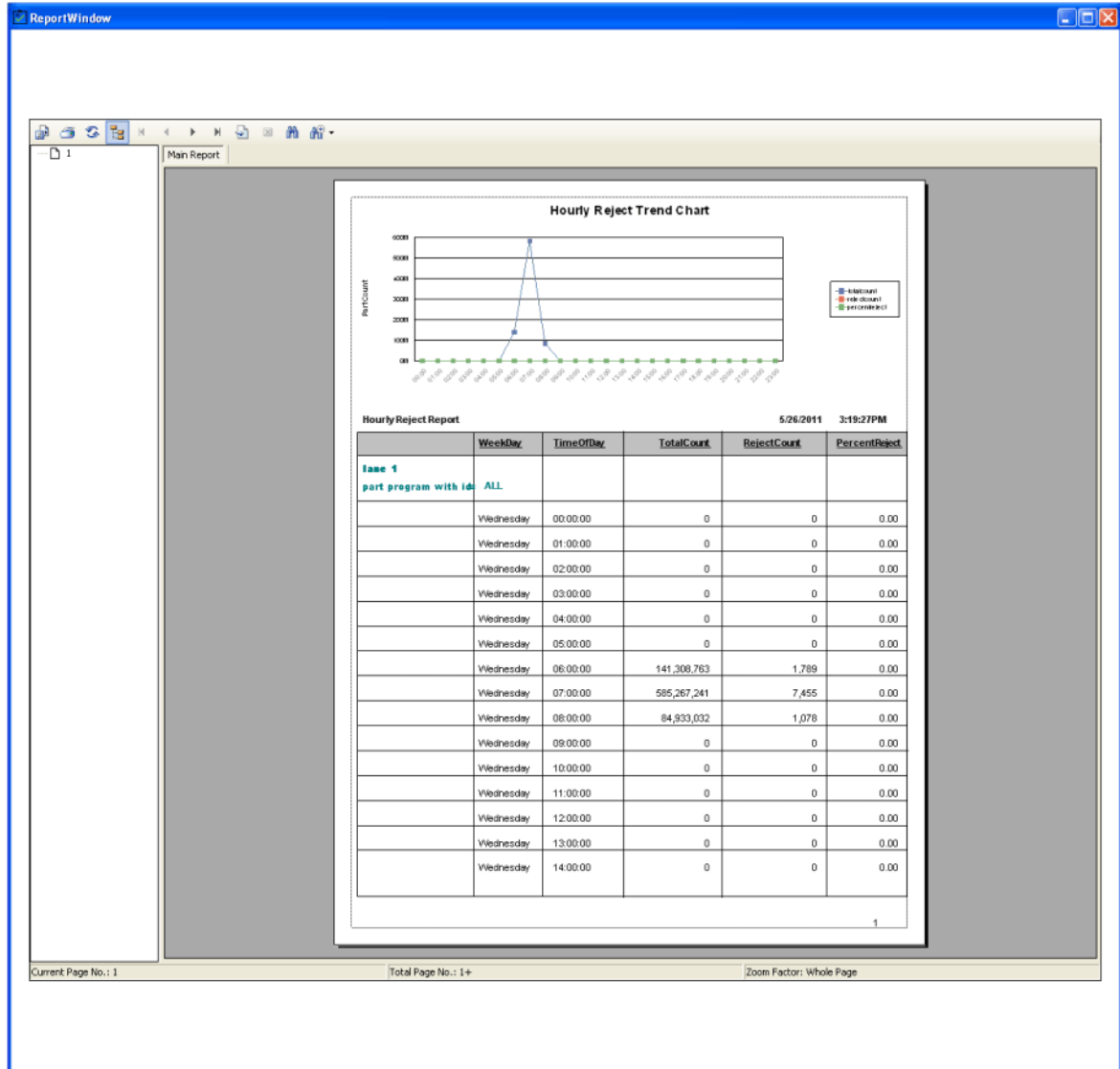
Select the **View Report** button to display the Report Window which generates the report. This window provides view, print, and export capabilities. Reports may be exported as:

- Crystal Reports (*.rpt)
- Adobe Acrobat (*.pdf)
- Microsoft Excel (*.xls)
- Microsoft Word (*.doc)
- Rich Text Format (*.rtf)



Hourly Reject Report

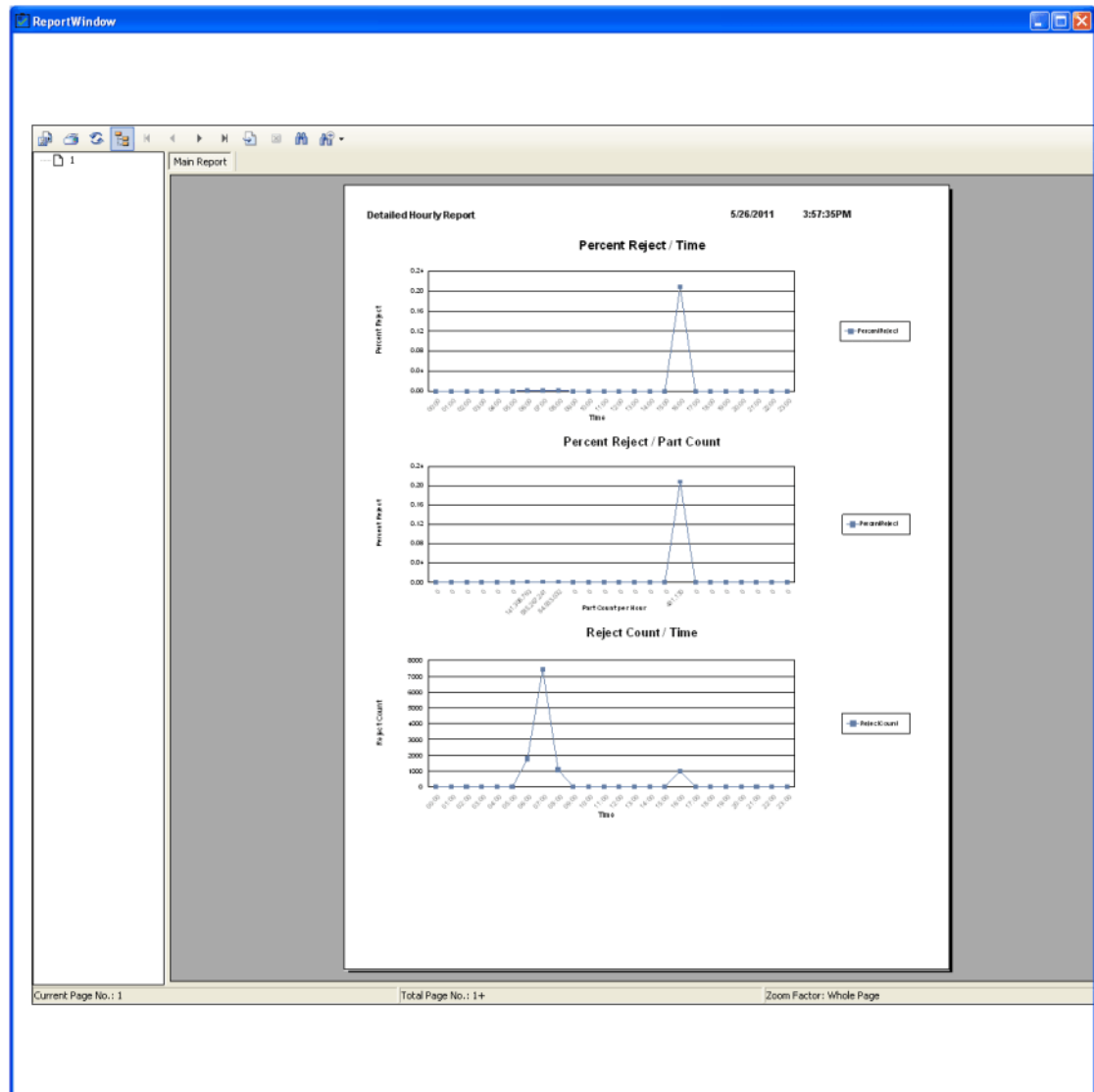
The Hourly Reject Report provides a reject trend chart which graphs inspected count and reject count over time at hour increments. In addition, the report includes a table of data point at hour intervals.



Detail Hourly Reject Report

The Detail Hourly Reject Report provides three trend charts:

- Percentage of parts rejected over time
- Percentage of parts rejected over part count
- Number of parts rejected over time



In addition, the report includes a table of data point at hourly intervals, as shown below.

ReportWindow

1

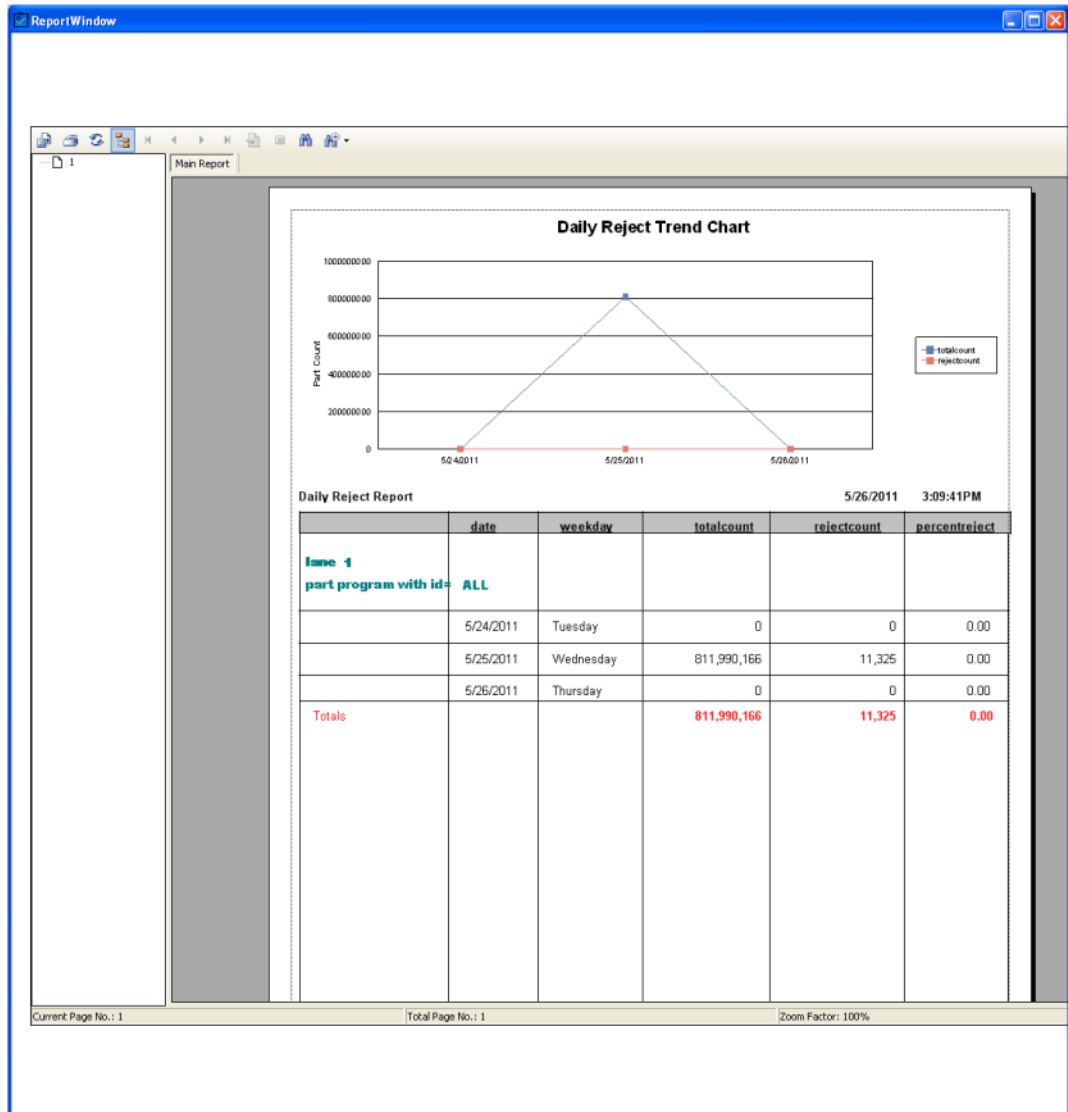
Main Report

	Weekday	TimeOfDay	PartCount	RejectCount	PercentReject
	vWednesday	00:00:00	0	0	0.00
	vWednesday	01:00:00	0	0	0.00
	vWednesday	02:00:00	0	0	0.00
	vWednesday	03:00:00	0	0	0.00
	vWednesday	04:00:00	0	0	0.00
	vWednesday	05:00:00	0	0	0.00
	vWednesday	06:00:00	141,308,763	1,789	0.00
	vWednesday	07:00:00	585,267,241	7,455	0.00
	vWednesday	08:00:00	84,933,032	1,078	0.00
	vWednesday	09:00:00	0	0	0.00
	vWednesday	10:00:00	0	0	0.00
	vWednesday	11:00:00	0	0	0.00
	vWednesday	12:00:00	0	0	0.00
	vWednesday	13:00:00	0	0	0.00
	vWednesday	14:00:00	0	0	0.00
	vWednesday	15:00:00	0	0	0.00
	vWednesday	16:00:00	481,130	1,003	0.21
	vWednesday	17:00:00	0	0	0.00
	vWednesday	18:00:00	0	0	0.00
	vWednesday	19:00:00	0	0	0.00
	vWednesday	20:00:00	0	0	0.00
	vWednesday	21:00:00	0	0	0.00
	vWednesday	22:00:00	0	0	0.00
	vWednesday	23:00:00	0	0	0.00
Total			11,990,166.00	11,325.00	0.00

Current Page No.: 2 Total Page No.: 2 Zoom Factor: Whole Page

Daily Reject Report

The Daily Reject Report provides a reject trend chart which plots the number of parts inspected and number of parts rejected over time at daily increments. In addition, the report includes a table of data points at daily intervals.



MAINTENANCE

The Maintenance tab provides controls for monitoring and managing the Defect Database. The left panel contains a circular gauge that displays the percentage of database (DB) usage. This gauge indicates what percentage of the database's maximum capacity is currently in use. To the right of this gauge is status information that reflects the current health of the Defect Database. The right panel contains a button to launch the Database Manager and a button to launch the Defect Image Manager.



❖ **TIP:** Pressco recommends using the **Trim Database** (on page 332) feature, as well as using **Backup Database** (on page 331) to save older data and creating a new database. These methods put you in control of your data, and avoids delays when you put the system online.

Circular Gauge

The needle on the database usage gauge points to the current database capacity. The maximum database capacity is preset to a maximum of 500,000 defect outputs from inspections. For example, when the gauge is at 20% this means that approximately 100,000 defects have been saved to the database.

Once the gauge reaches 100% then the database has exceeded its preset capacity. Once this capacity has been exceeded then the Intellispec system automatically attempts to trim the database at the next necessary opportunity. It will delete the oldest 80% of data and the corresponding images; typically this occurs when you attempt to put a lane online without performing the necessary backup and database trimming. To avoid loss of data, a database **backup** (see "**Backup Database**" on page 331) should be performed prior to reaching the 100% mark. It is not necessary to back up the database if there is no desire to retain this data.

❖ *Note: the DB Usage may exceed 100%. This means that Intellispec has not had the opportunity to perform a trim and the artificial preset limit has been exceeded. This can lead to significant delays in placing a lane online and possible loss of data due to performance problems associated with dealing with a large database.*

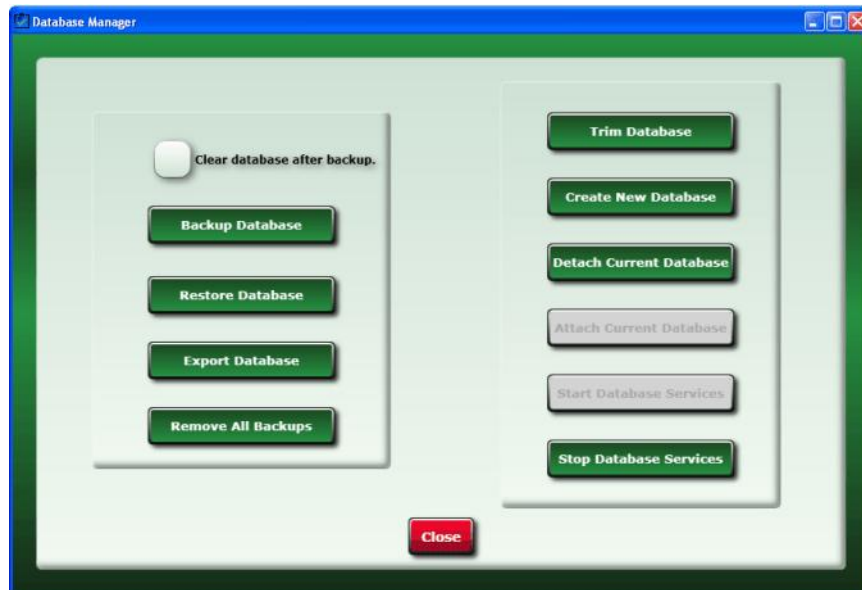
Status information

Status information, next to the circular gauge, includes:

- Database (DB) Usage %
- Failed Inspections - current number of defects saved to database
- Maximum Failed Inspections - maximum capacity of database in terms of defect count
- Trim Factor - percent of database that will be deleted when trim performed
- SQLite Status - whether it is running or stopped
- Database Status - whether it is ready, stopped, detached, or there is an error
- Database Version - version number of database
- Last Backup - time of last backup; "N/A" is displayed if a backup has never been performed
- Auto Trim Status - time of last auto trim; "N/A" is displayed if an auto trim has never been performed
- Last Trim - time of the last database trim; "N/A" is displayed if a trim has never been performed

Database Manager

The **Database Manager** button from the Maintenance screen launches the Database Manager which provides database backup, restore, export, and trim capabilities.



Backup Database

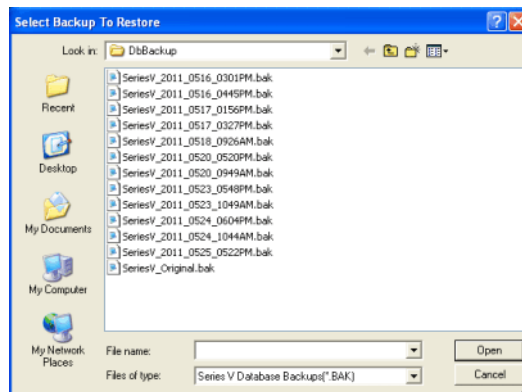
The Defect Database can be backed up by selecting the **Backup Database** button from within the **Database Manager** (on page 330). The database is saved to a directory reserved for backups. The file type of the backup is “.bak”. The default name given to the backup is the database name with a time stamp concatenated at the end, for example, SeriesV_2009_1210_1011AM.bak. If you select the “Clear database after backup” checkbox then all defect data is cleared, otherwise the Defect Database remains unaltered.

Restore Database

The Defect Database can be restored from a previously saved backup.

To restore the database:

1. Select the **Restore Database** button. A dialog box opens to the location of the saved backups.



2. Select the desired file backup (*.bak) to restore.
3. Select the **Open** button on the dialog box to restore the database. Be aware that restoring the database will destroy any current defect data; however, a warning prompt is displayed providing the opportunity to abort the process.

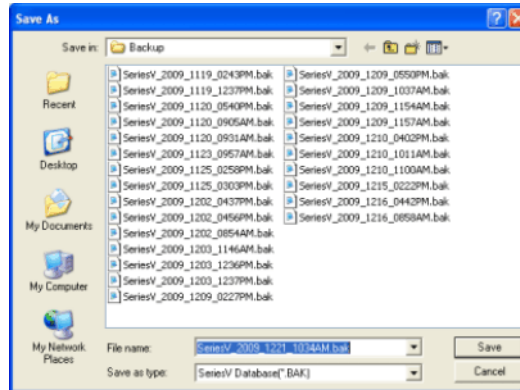
❖ *Note: the Restore function can be used to restore any backups that were **exported** (see "**Export Database**" on page 331). Use the Open Dialog Box to navigate to the file source location.*

Export Database

The **Database Manager** (on page 330) provides export capability to make the Defect Database portable. The Defect Database can be exported to any local directory or network location, including a USB drive.

To export the database:

1. Select the **Export Database** button from the Database manager. A Save As dialog box is displayed, providing the option to choose the file destination. Note that the file type must be ".bak". The name can be any valid Windows file name.



2. Enter a name for the exported database in the File Name box.
3. Select the **Save** button. The database is exported.

Trim Database

The Defect Database has finite amount of storage. To maintain optimal performance, it is trimmed when its capacity exceeds a preset threshold of 500,000 defect records. This trim is performed automatically by the Intellispec which results in the deletion of 80% of the defect data. Alternatively, you may manually trim the database by using the **Database Manager** (on page 330).

You may see the following warning when you start the Intellispec. Trim the database as necessary.



To manually trim the database:

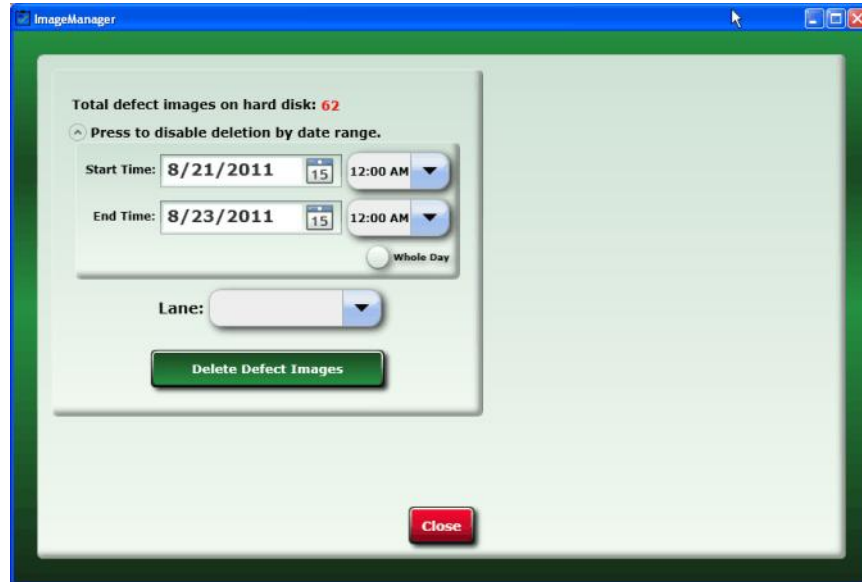
Select the **Trim Database** button from the **Database Manager** (on page 330). For a large database, this operation may take a few minutes. Note that the manual trim deletes the oldest 10% of data. It also trims the oldest 10% of the images associated with those database records.

Detach/ Attach Current Database

This button (in the **Database Manager** (on page 330)) presently does nothing due to the nature of the SQLite database.

Defect Image Manager

Click the **Defect Image Manager** button from the Maintenance screen to launch the Image Manager. This option allows you to delete images associated with database defects. It becomes important to delete images when the disk is near or becomes full.



- Click the arrow to enable deletion by date range.
- Choose a lane to delete images associated with a particular lane.
- Click the **Delete Defect Images** button to delete the selected images.

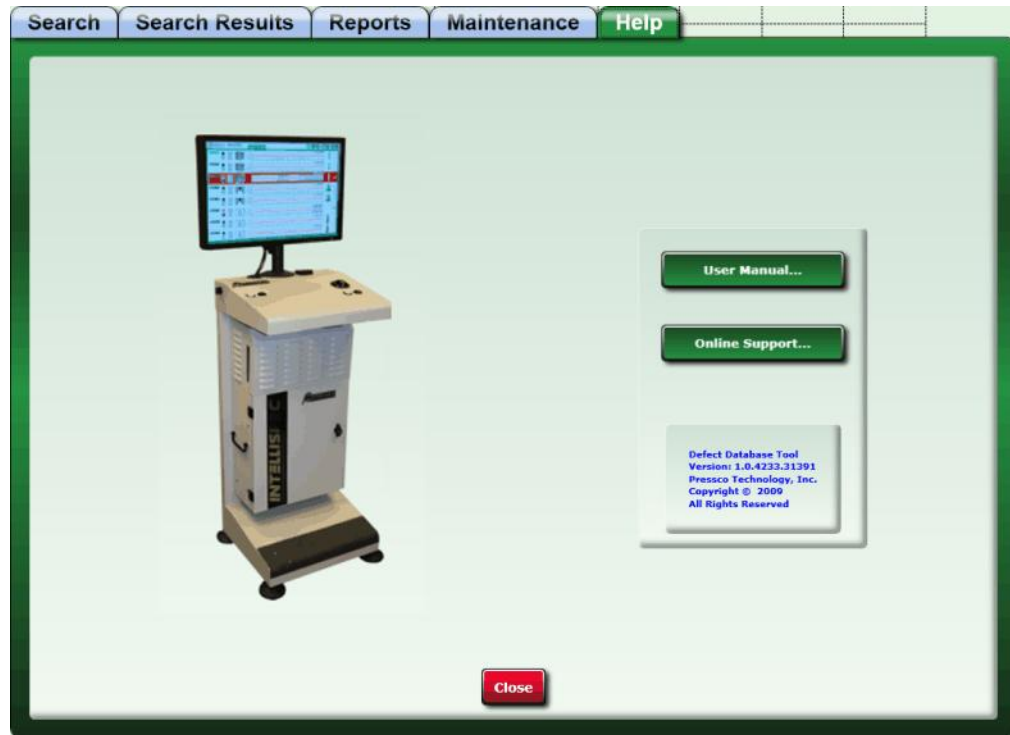
❖ *Note: Trim Database (on page 332) also deletes images.*

Refresh Database Status button

This button does nothing due to the nature of the SQLite database.

HELP

The Help tab provides access to technical help as well as version information for the Defect Database Tool. The help tab has two buttons: **User Manual** and **Online Support**. The online support is disabled if an internet connection is not available. Otherwise, selecting the online support button opens the default browser to Pressco's support web page. Selecting the user manual button opens the Intellispec user's manual. The user's manual contains both a table of contents and index to easily locate the subject matter of interest.



Chapter 18

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Business Hours:

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

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