

INTELLISPEC™

Cap 360 F1895 Series 6 Module

Pressco Technology Inc.

80627 Rev. 01



Table of Contents

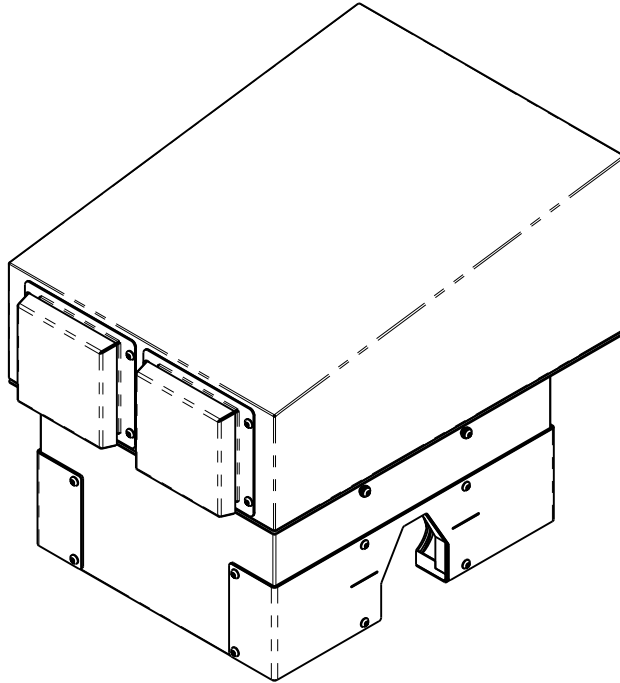
- Chapter 1 Cap 360 Inspection Module.....5**
- Cap 360 Inspection Module Dimensions6
- Components included in the Cap 360 Module6
- Adjustments.....11
- Maintenance15
- Wiring Diagram - Cap 360 Module 77882W sheet 1 of 318
- Wiring Diagram - Cap 360 Module 77882W sheet 2 of 319
- Wiring Diagram - Cap 360 Module 77882W sheet 3 of 320
- Chapter 2 Extended I/O (Optional).....21
- Index33**

Chapter 1

Cap 360 Inspection Module

The Cap 360 Inspection Module has four color cameras that are mounted so that they inspect 360 degrees of the side of the cap. An optional fifth color camera may be installed to inspect the top of the cap. (The cameras must be specified upon purchasing the module)

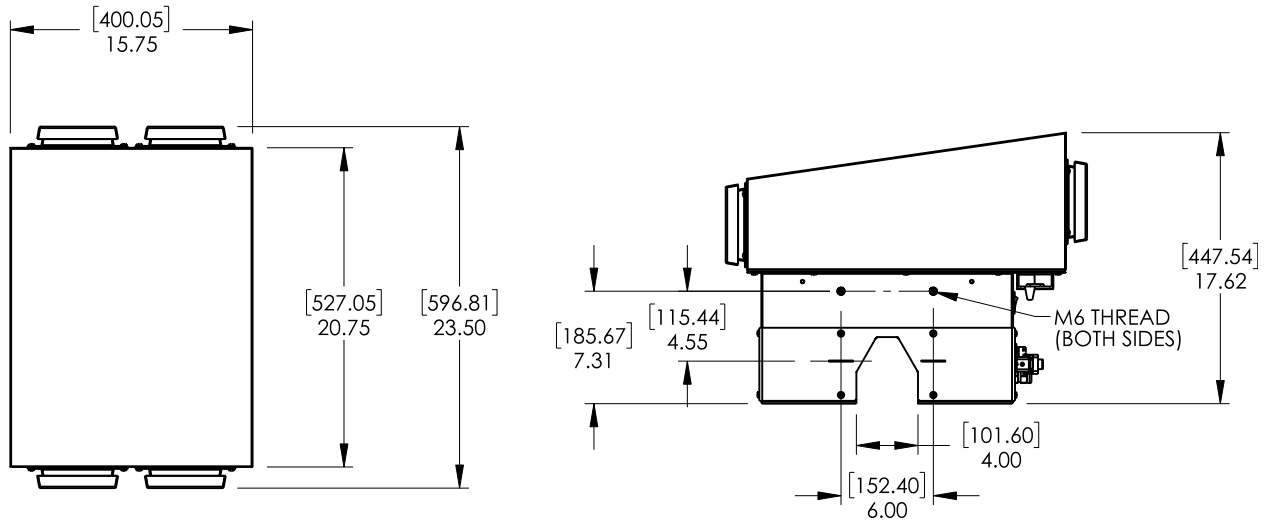
❖ *Note: this inspection module is for Series 6 and 6i systems, not Series 5 or 5i.*



Below is an example of the images on the Intellispec screen. Items 1-4 are the four side cameras. Number 5 is the optional top cap view. Number 6 is the optional High Frequency module inspection (sold separately).

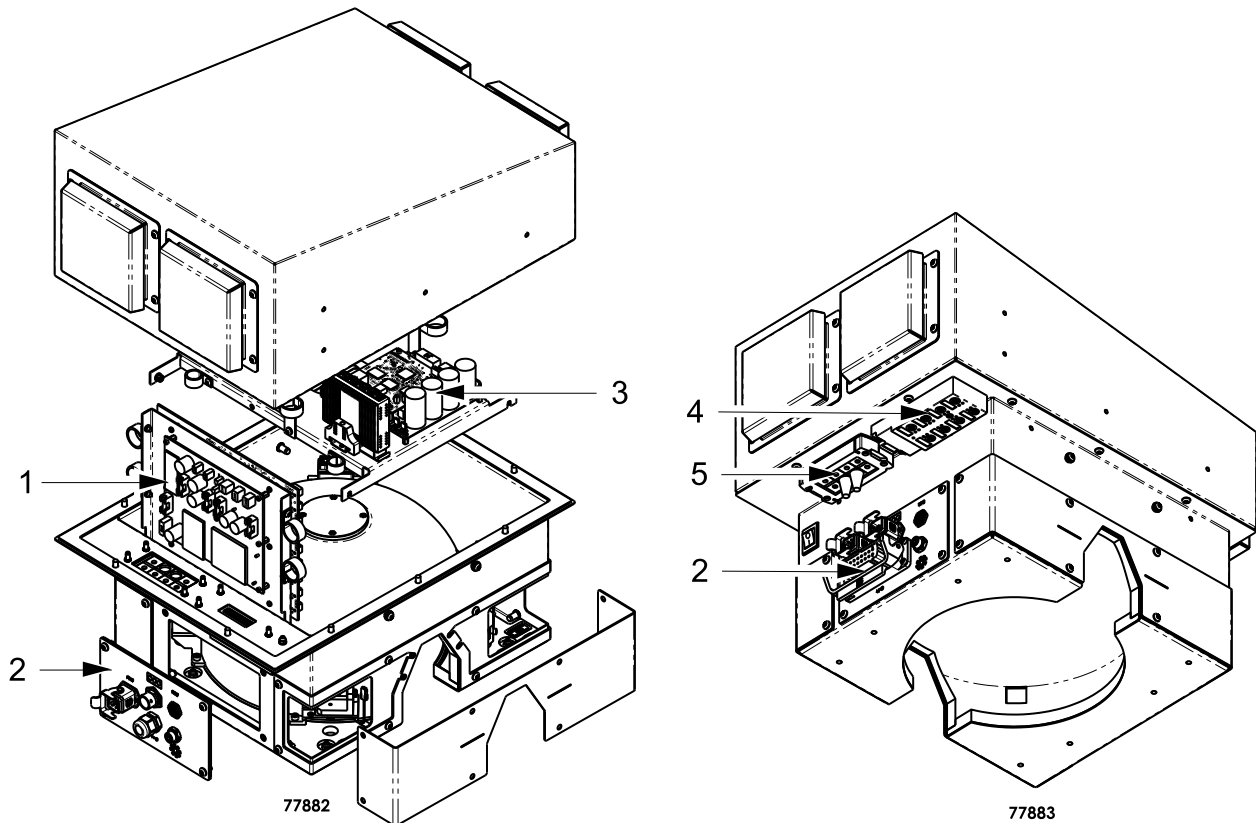


Cap 360 Inspection Module Dimensions



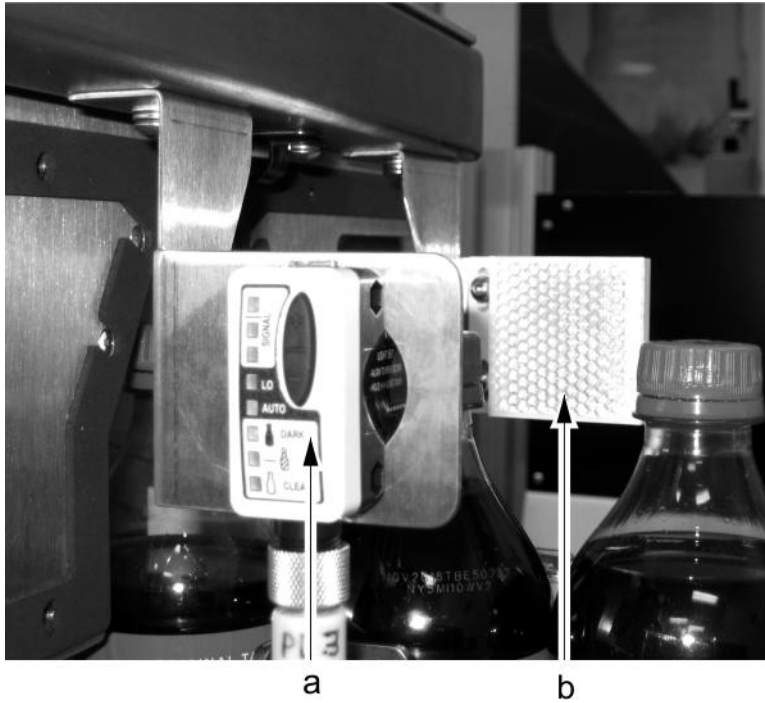
The measurements are in inches. The numbers in brackets are in millimeters.

Components included in the Cap 360 Module

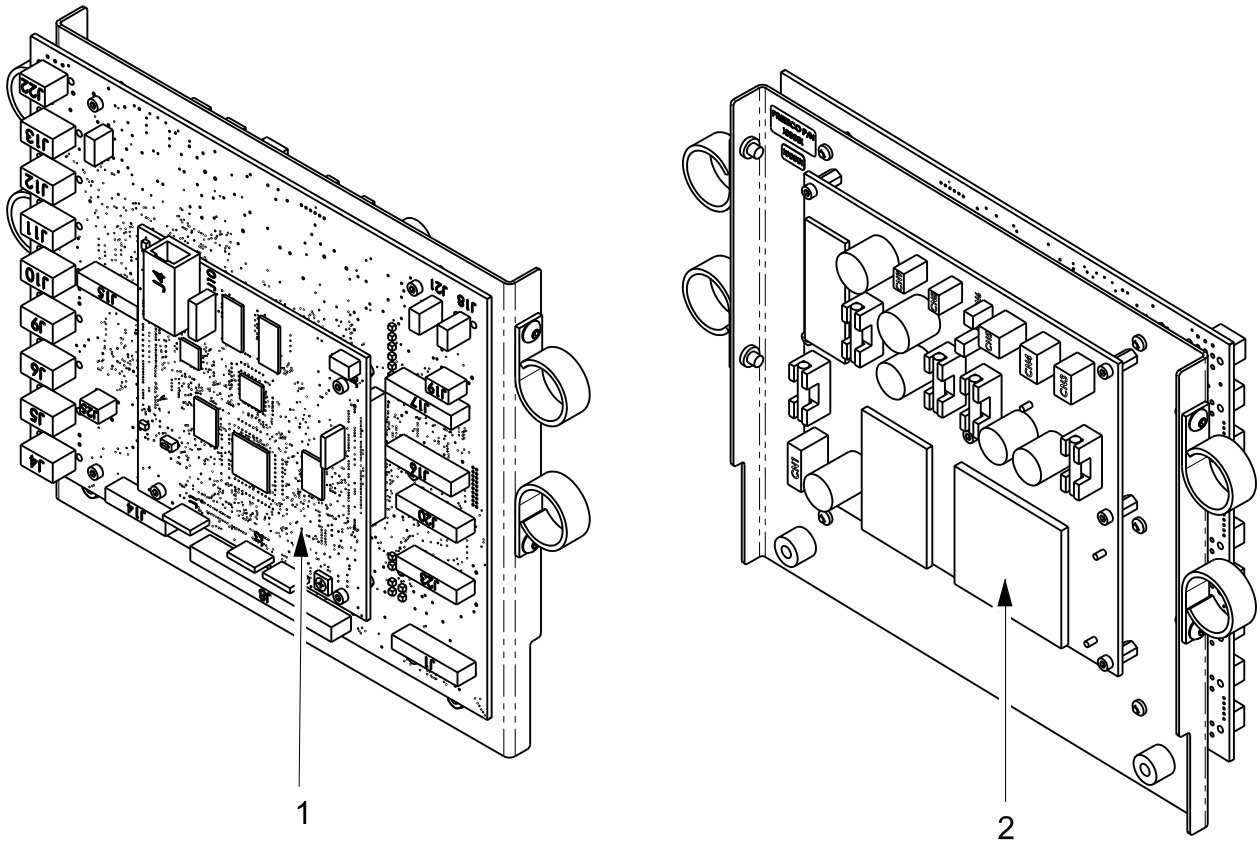


- 1) **Part Tracker Board and DC/ DC Converter Module** (on page 7)
- 2) Gland Plate (this is different in modules **77882** (see "**Gland Plate in module 77882**" on page 8) and **77883**)
- 3) **Control boards** (see "**Control Boards in module 77882**" on page 9)
- 4) 8-port I/O box
- 5) Cable entry for cameras and data

The part detector [a] and reflector [b] (shown below) are mounted on the side of the module.



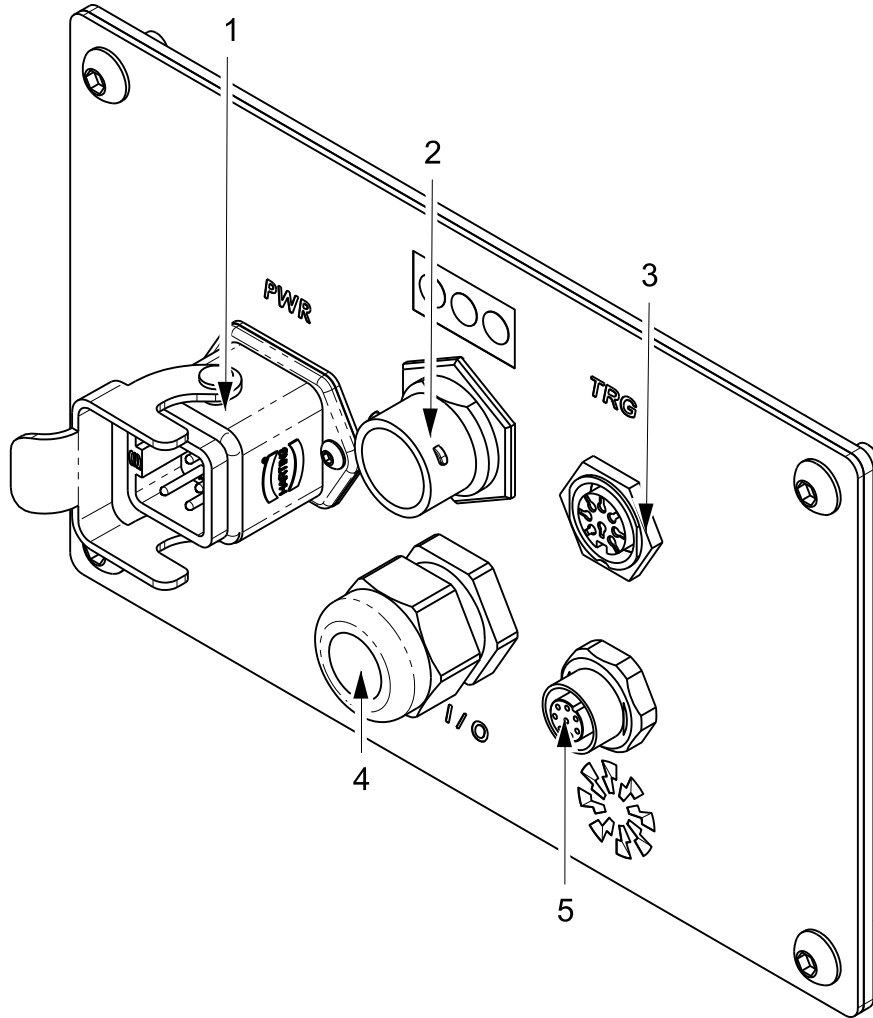
Part Tracker Board and DC/ DC Converter Module



1) 8-Channel Part Tracker Board

2) *DC/ DC Converter Module* (see "*Fuses - DC/ DC Converter Module*" on page 9)

Gland Plate in module 77882

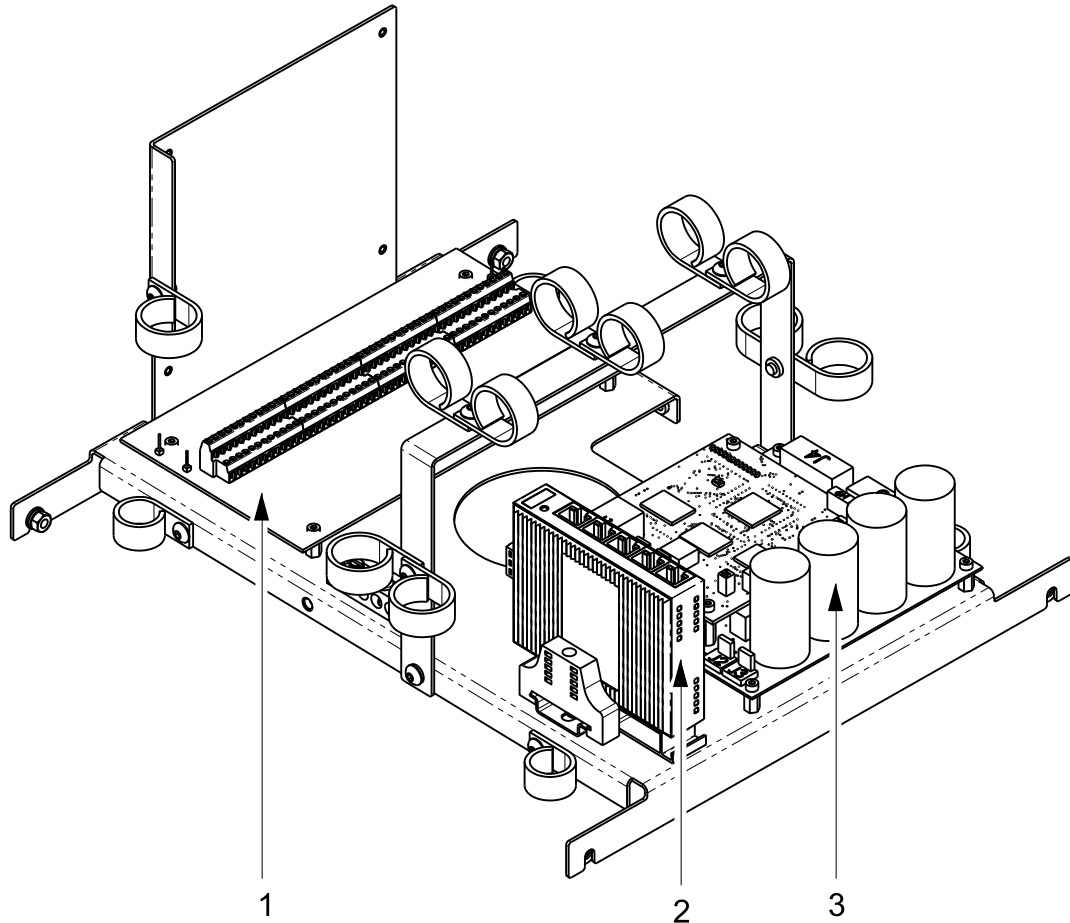


Connections for:

- 1) 60V DC in
- 2) Light tree cable
- 3) Trigger/ power cable for the cameras
- 4) Cable for **Extended I/O** (see "**Extended I/O (Optional)**" on page 21)
- 5) Encoder cable

See also the wiring diagrams: **Wiring Diagram - Cap 360 Module 77882W sheet 1 of 3** (on page 18)

Control Boards in module 77882



- 1) *Extended I/O Board* (on page 21)
- 2) 5-port Ethernet Switch
- 3) Driver/ Light Control Board

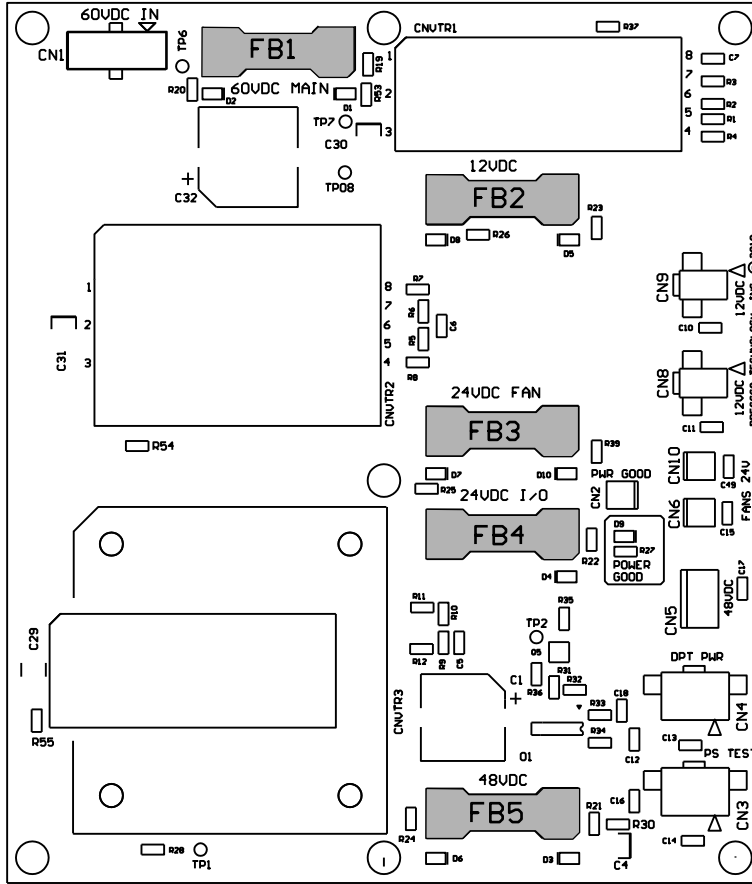
Fuses - DC/ DC Converter Module



Warning - For continued protection against fire hazard, replace fuses only with the same type and ratings. The use of other fuses or materials is prohibited.



Warning - Disconnect the product from the mains supply before replacing the fuse(s).



Install Time delay Type 520 fuses :

- FB1: 5 Amp (GMC 5A-R) 75517
- FB2: 5 Amp (GMC 5A-R) 75517
- FB3: 3 Amp (GMC 3A-R) 75519
- FB4: 3 Amp (GMC 3A-R) 75519
- FB5: 4 Amp (GMC 4A-R) 75518

Cooper Bussmann or equivalent

Install time delay type 520 fuses, Cooper Bussmann or equivalent:

Fuse kit: part number 78311			
Fuse		Description	Pressco Number
FB1	60 VDC Main	5 Amp 250V 5x20mm time delay	75517
FB2	12 VDC	5 Amp 250V 5x20mm time delay	75517
FB3	24 VDC fan	3.15 Amp 250V 5x20mm time delay	75519
FB4	24 VDC I/O	3.15 Amp 250V 5x20mm time delay	75519
FB5	48 VDC	4 Amp 250V 5x20mm time delay	75518

Adjustments

Inspection module adjustments include the camera position, aperture, and camera focus.

- ❖ *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.*

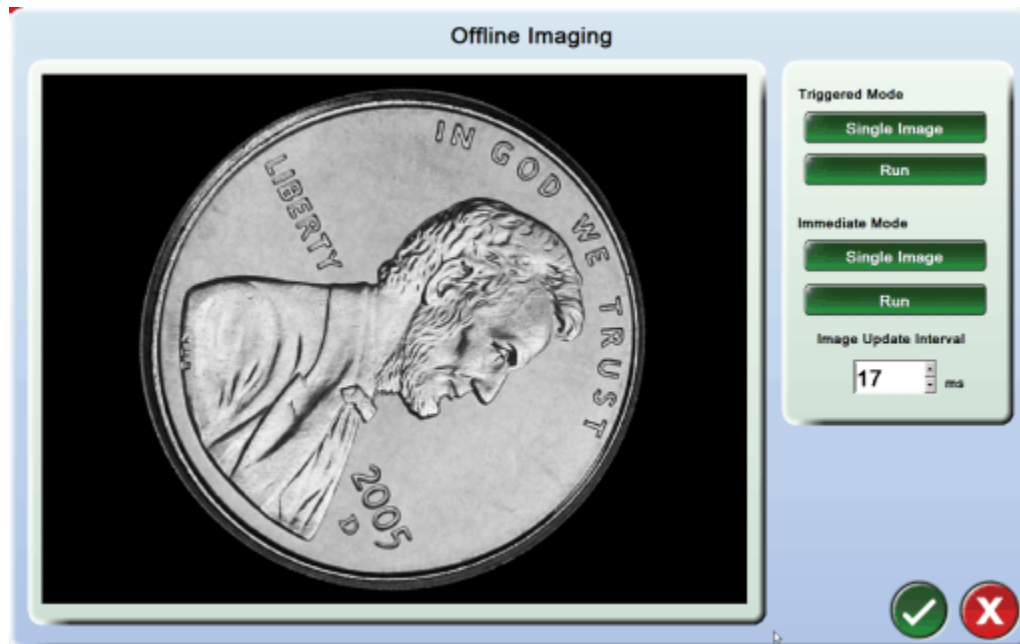
The **focus** adjustment controls the clarity of the image; the **aperture** adjustment controls the amount of light admitted by the shutter.




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 the Part Image

When adjusting the focus, aperture, or height for any inspection module, it is helpful to use Offline Imaging so that you can immediately see the effect of an adjustment on the image quality.



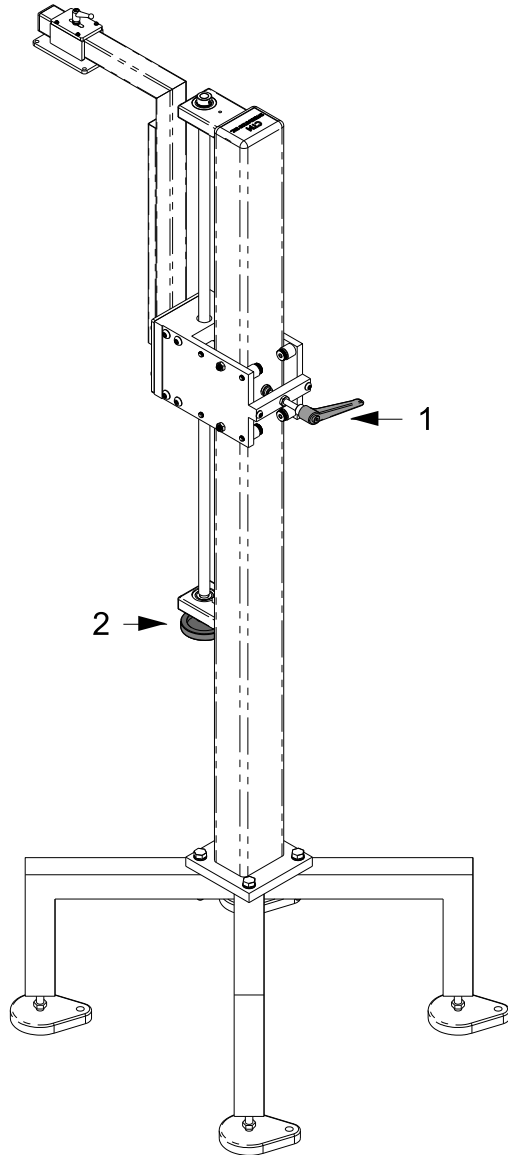
➤ To use Run in Immediate Mode:

1. Make sure the lane is offline.
2. Select a sensor , then right-click the button.
3. Select **Offline Imaging** from the menu.
4. Click the **Run** button under Immediate Mode, then run a part through the inspection module.

While the system is in this mode, you will be able to make adjustments to focus, aperture, or camera height.

Part Changeover - Camera Height Adjustment

If you begin inspecting a new product that has a different bottle size, and the part image has moved on screen, then you may need to adjust the module height.



➤ **To adjust the height of the module:**

1. Write down the current height, according to the scale on the stand, or mark the current position with a marker. Record this height with the previous part type/size, so that you can easily set that position again for future production runs.

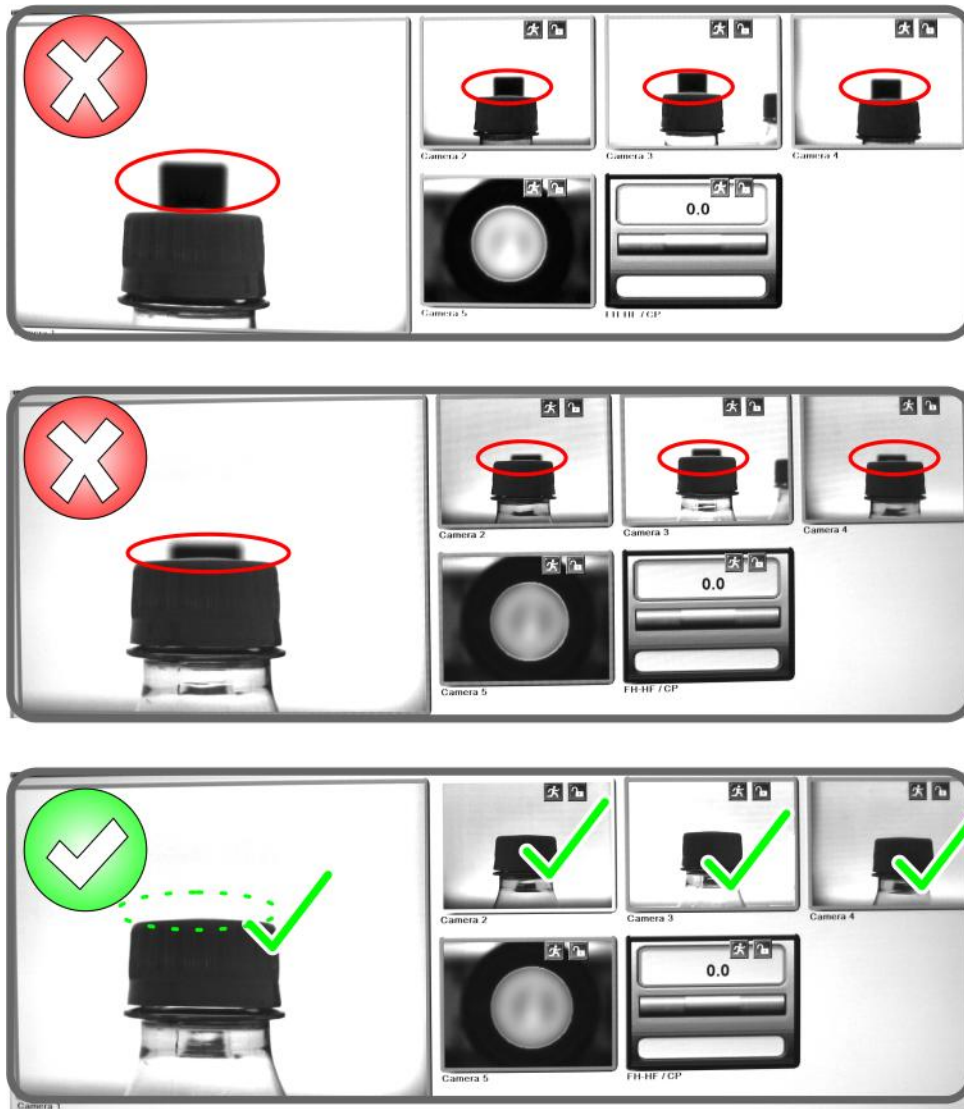
Freeze on Defect

2. Look at the part images. It is helpful to see all images at once. Select the **Freeze on Defect** button. An example is shown below. (For more information, see Freeze on Defect)
3. The cap should be in the center of the image. This allows the cameras to look straight across the cap for proper inspection. See examples below.
4. Loosen the locking handle [1].
5. Turn the knob [2] to move the module up or down. Turn it so that the part image is in the correct position on screen.

❖ *The Part Detector is mounted to the same bracket as the module, and was initially set up to detect the middle of the cap. You do not need to move the part detector separately.*

6. When the module is in the correct position, lock the locking handle [1].
7. Record the height from the scale on the stand. Write the bottle type/ size, and the scale position. You can use this setting for inspecting the same part in the future.

Cap position: adjust the module height so that the cap covers the black box in the image, which is the camera window on the opposite side of the tunnel.



Aperture and Focus Adjustments

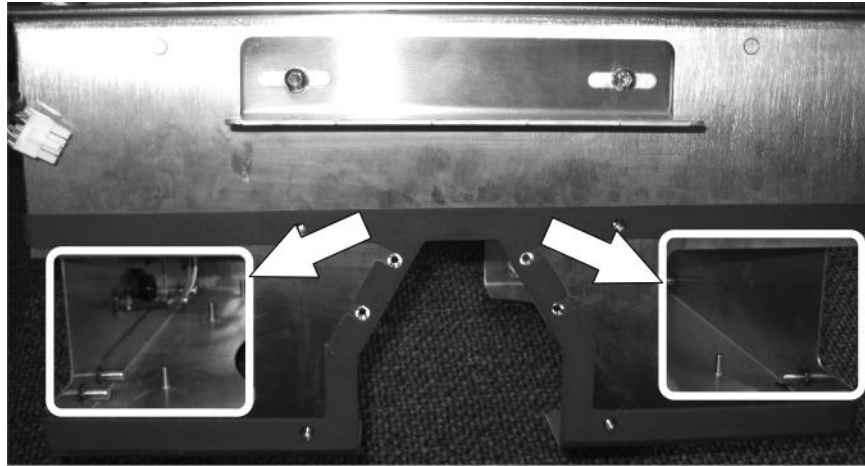
Aperture and focus usually do not need to be adjusted in this module.

If a camera has been replaced or knocked out of place, you may need to adjust the aperture or focus on the lens.

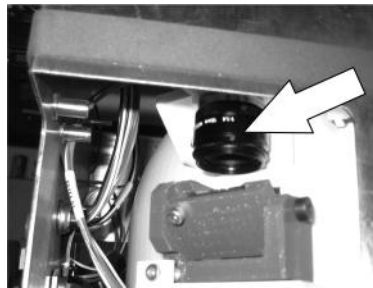
➤ **To access the camera lens:**

1. Remove the camera module cover.

2. Access the camera lens through the opening in the frame.



3. Make the adjustments to the focus or aperture as needed.



4. Replace the module cover.

Lighting Adjustments

To adjust the lighting, use the software adjustments.

To see the image on the screen:

Observe the Part Image (on page 11)

Adjust lighting through either:

- Basic adjust lighting, or
- Advanced adjust lighting

Most often, you will use Basic Adjust Lighting.

Maintenance



Turn off power before opening the module or cabinet.

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.

Cleaning Optical Surfaces



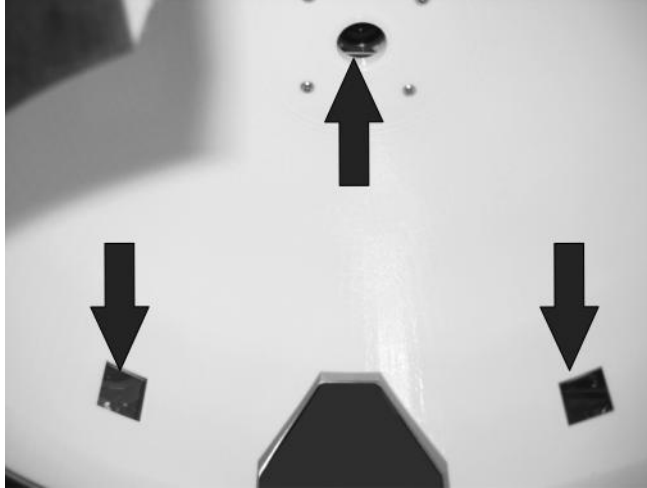
Important - Debris and contamination could build up on both the glass and plastic surfaces. This dirt could appear in the inspection windows, causing false rejects of parts, or it could degrade lighting. Clean glass and plastic surfaces often to avoid false rejects.

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.

Clean Camera Windows

The small windows that the cameras look through need to be cleaned once per month. Below is a picture of inside of the dome of the inspection module. Your module may have four or five camera windows.

You can clean the windows from inside the tunnel. If your image is blurry or has spots on it, you may need to clean the windows more thoroughly (see below).



Clean the window(s) on the inspection module **once per month**.

❖ *Note: Cleaning frequency will depend on plant and process conditions.*

➤ **To clean plastic surfaces:**

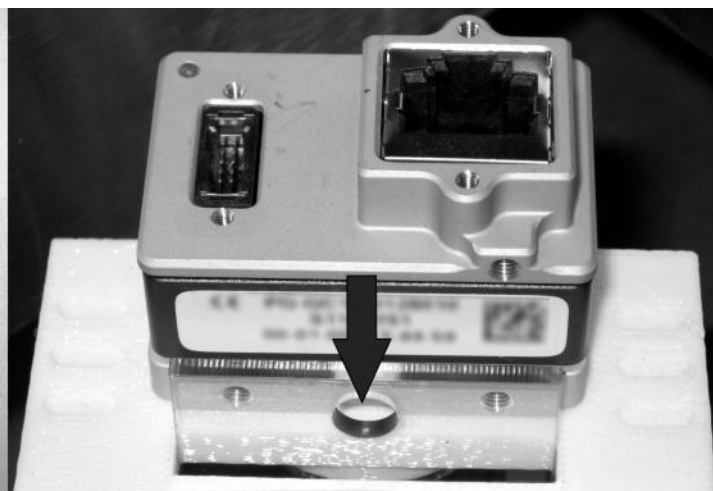
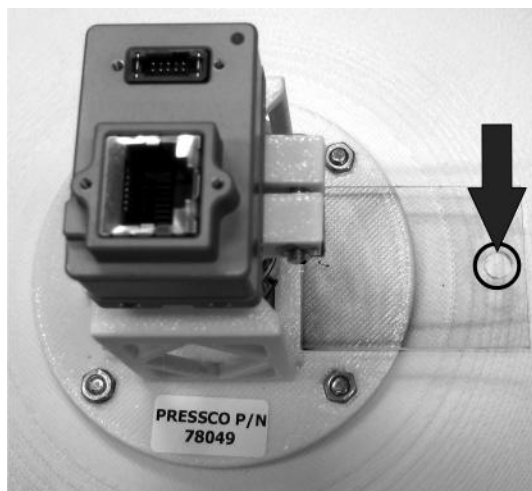
- Use canned compressed air to blow away dust
- Use a clean, non-abrasive cloth dampened with mild soap and water solution. Saturate surface completely to let particles wash away.
- Dry the surface with clean, compressed air

➤ **Do not:**

- wipe away dirt as plastic coating may be scratched
- use paper towels or paper napkins – these may scratch surfaces

➤ **To clean the windows thoroughly:**

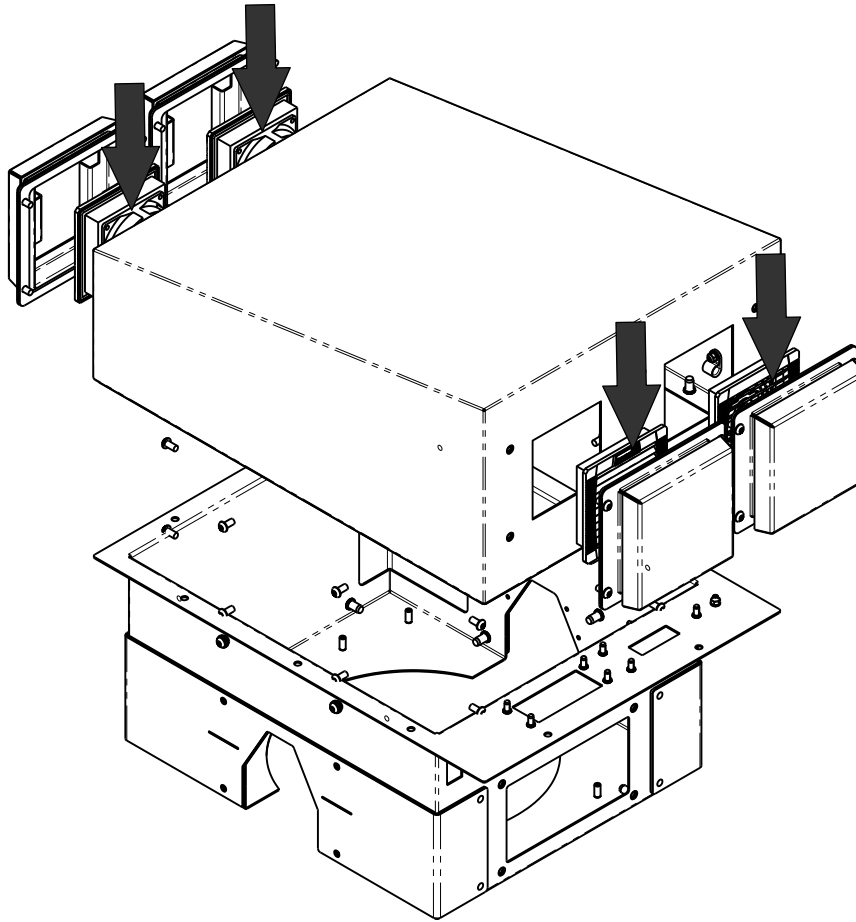
1. Remove the inspection module cover.
2. Using a small hook tool, put the hook in the hole of the window and slide it out. Your module may have four or five camera windows.



3. Clean the windows using instructions for cleaning plastic surfaces above.
4. Replace the windows in the proper slots.
5. Replace the module cover.

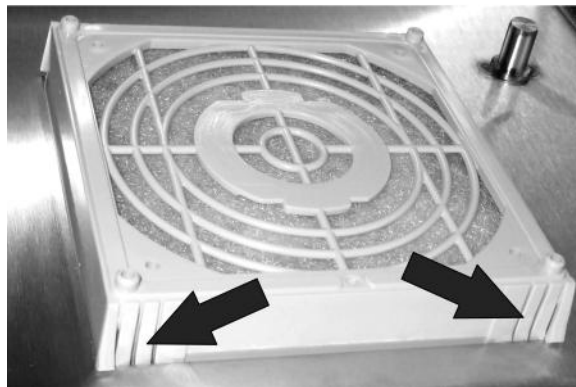
Clean or Replace the Cap 360 Fan Filters

Clean the filters at least once a month.



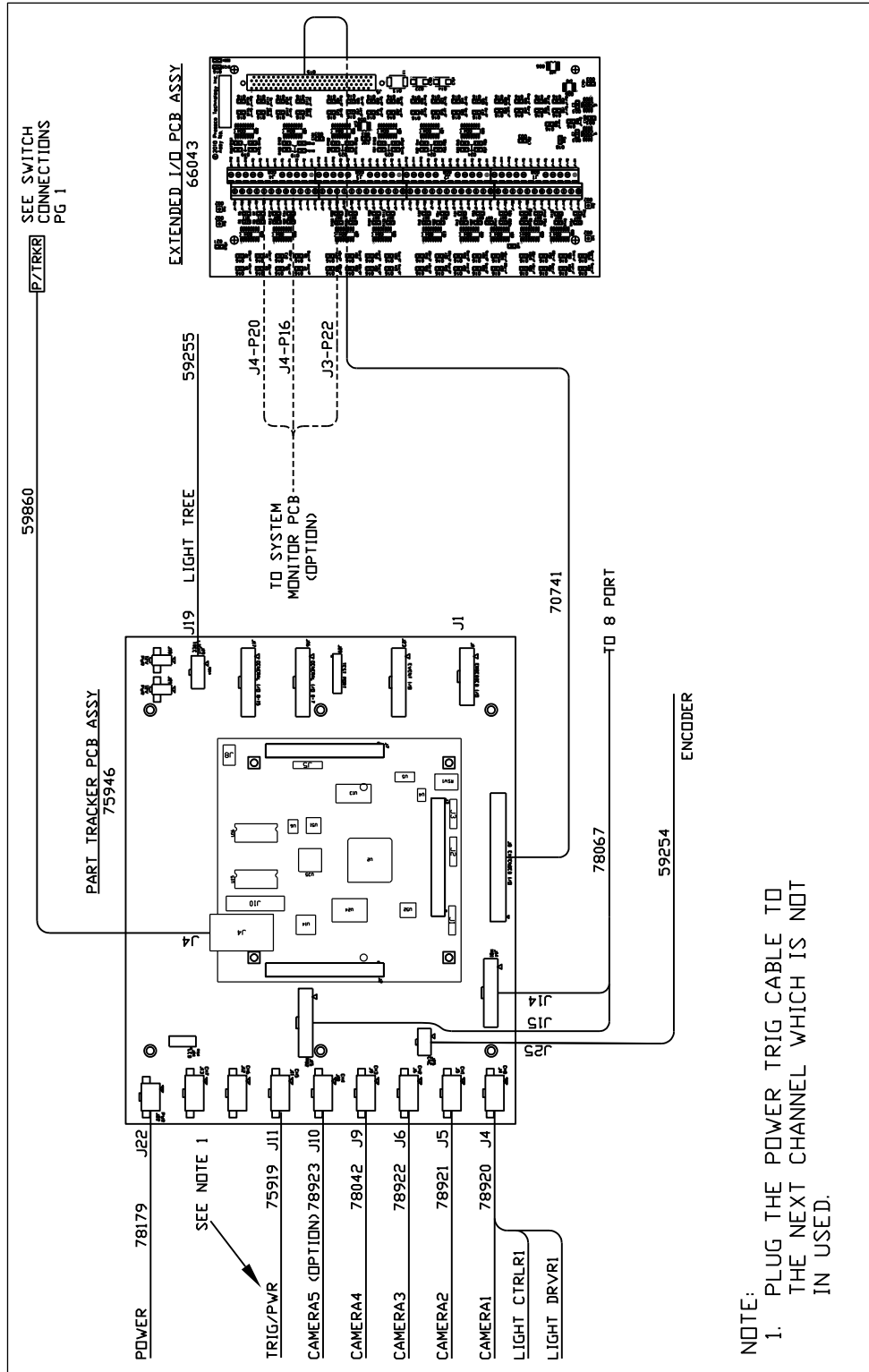
➤ To clean the filter:

1. Remove the top cover from the inspection module.
2. Push the tabs to remove the fans and exhaust filters from the cover (quantity 4 filters).

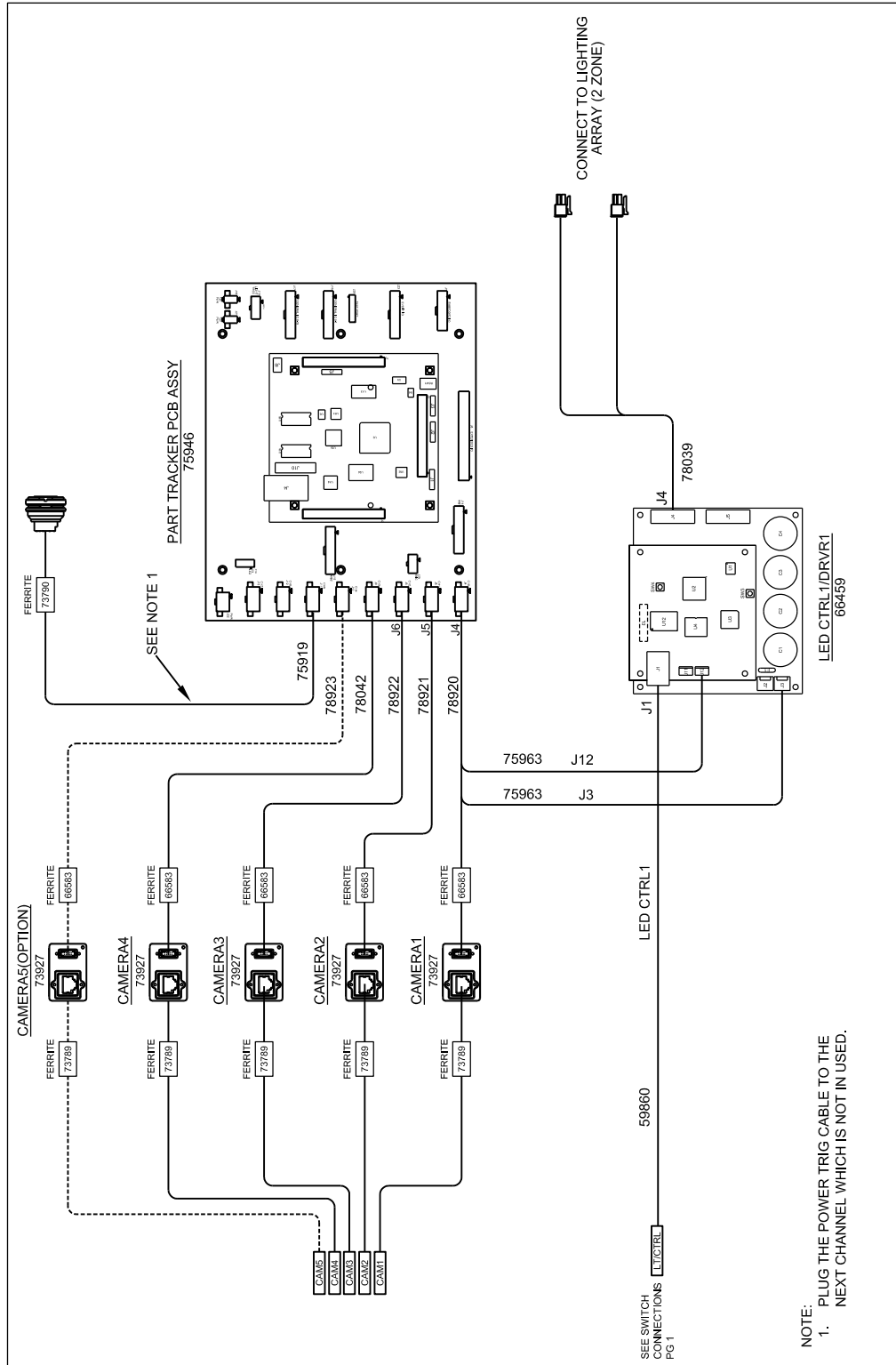


3. Pull the filters out and clean them.
 - If the filter contains only dry dust and dirt, rinse it in plain water

Wiring Diagram - Cap 360 Module 77882W sheet 2 of 3



Wiring Diagram - Cap 360 Module 77882W sheet 3 of 3



Chapter 2

Extended I/O (Optional)

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).*
-

Extended I/O board

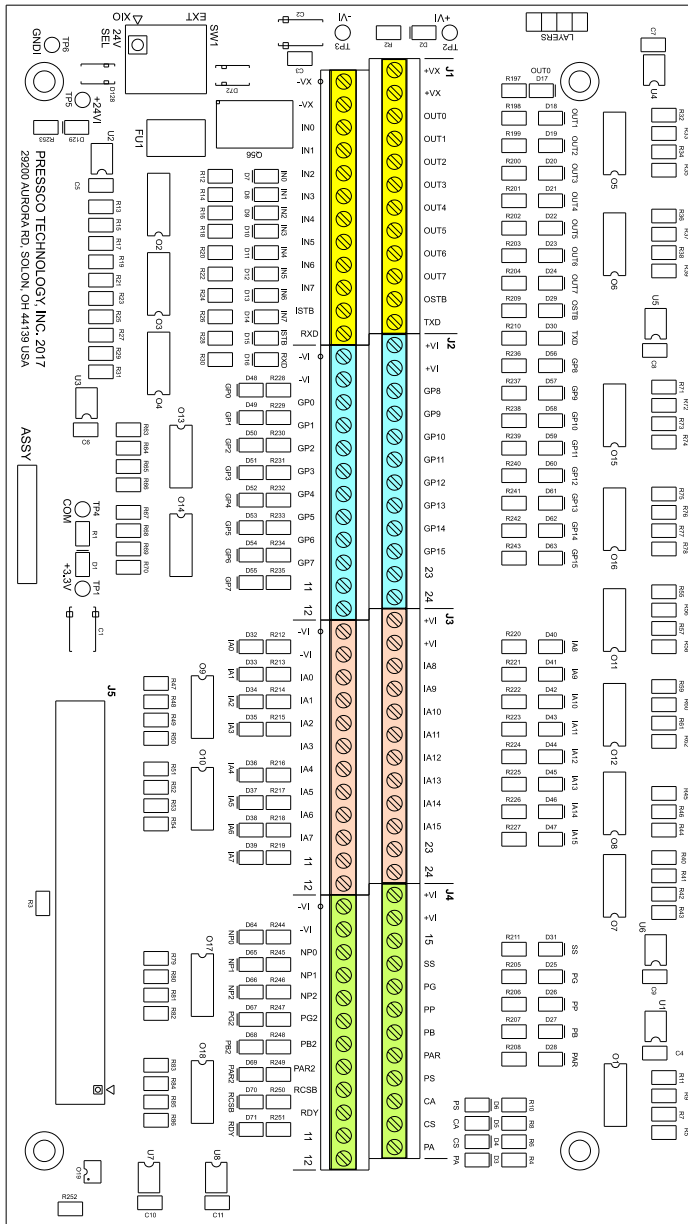
This optional module provides additional input and output ports for communicating with the Intellispec Series 6 system. The board may be installed within a cluster box or within an inspection module. The board is connected to the lane's Part Tracker board via a ribbon cable.

-
- ❖ *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 29).

Below is the layout for the Extended I/O board. **Extended I/O Signals S6** (on page 22)

Switch SW1 selects Intellispec 24V power supply or User 24V power supply.



Series 6			
Signal	Label	Signal	Label
User +24VDC	+VX	System State	SS
User 24VRET	-VX	Part Present	PP
+24VDC	+VI	Part Good	PG
24VRET	-VI	Part Bad	PB
Generic Input n	INn	Part at Reject	PAR
Generic Output n	Outn	Part Good 2	PG2
Input Strobe	ISTB	Part Bad 2	PB2
Output Strobe	OSTB	Part at Reject 2	PAR2
Group n	GPn	Print Statistics	PS
Inspection Alarm n	IAn	Clear Alarms	CA
Not Processed n	NPn	Clear Statistics	CS
Reject Confirm Sensor Blocked	RCSB	Preform Alarm	PA
RS232 Transmit	TXD	System Ready	RDY
RS232 Receive	RXD		

❖ *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 28).

Terminal	Signal and Indicator LED label	Input (I) or Output (O)	Comments
J1-1	User 24VRET (-VX)		
J1-2	User 24VRET (-VX)		
J1-3	Generic Input 0 (IN0)	I	Port 0 and Port 1 used in Remote Part Program Switching Generic Input bits may be used for Auto-Learn or Alternate Part Processing
J1-4	Generic Input 1 (IN1)	I	
J1-5	Generic Input 2 (IN2)	I	
J1-6	Generic Input 3 (IN3)	I	
J1-7	Generic Input 4 (IN4)	I	
J1-8	Generic Input 5 (IN5)	I	
J1-9	Generic Input 6 (IN6)	I	
J1-10	Generic Input 7 (IN7)	I	
J1-11	Input Strobe (ISTB)	I	
J1-12	RS232 RX (RXD)	I	
J1-13	User +24VDC (+VX)		
J1-14	User +24VDC (+VX)		
J1-15	Generic Output 0 (OUT0)	O	
J1-16	Generic Output 1 (OUT1)	O	
J1-17	Generic Output 2 (OUT2)	O	
J1-18	Generic Output 3 (OUT3)	O	
J1-19	Generic Output 4 (OUT4)	O	
J1-20	Generic Output 5 (OUT5)	O	
J1-21	Generic Output 6 (OUT6)	O	
J1-22	Generic Output 7 (OUT7)	O	
J1-23	Output Strobe (OSTB)	O	Pulsed When data of Generic Output Port (0-7) is set
J1-24	RS232 TX (TXD)	O	

Terminal	Signal and Indicator LED label	Input (I) or Output (O)	Comments
J2-1	24VRET (-VI)		
J2-2	24VRET (-VI)		
J2-3	Group 0 (GP0)	O	Pulses for 12 ms when an inspection fails in the user-defined group (online mode only) Walk By Setup
J2-4	Group 1 (GP1)	O	
J2-5	Group 2 (GP2)	O	
J2-6	Group 3 (GP3)	O	
J2-7	Group 4 (GP4)	O	
J2-8	Group 5 (GP5)	O	
J2-9	Group 6 (GP6)	O	
J2-10	Group 7 (GP7)	O	
J2-11	no connection		
J2-12	no connection		
J2-13	+24VDC (+VI)		
J2-14	+24VDC (+VI)		
J2-15	Group 8 (GP8)	O	See comments for Group 0 - 7 above
J2-16	Group 9 (GP9)	O	
J2-17	Group 10 (GP10)	O	
J2-18	Group 11 (GP11)	O	
J2-19	Group 12 (GP12)	O	
J2-20	Group 13 (GP13)	O	
J2-21	Group 14 (GP14)	O	
J2-22	Group 15 (GP15)	O	
J2-23	no connection		
J2-24	no connection		

Terminal	Signal and Indicator LED label	Input (I) or Output (O)	Comments	
J3-1	24VRET (-VI)			
J3-2	24VRET (-VI)			
J3-3	Inspection Alarm 0 (IA0)	O	Set when the associated alarm condition occurs and stays active until the alarm is cleared Lane Alarm Configuration and Sensor Alarm Configuration	
J3-4	Inspection Alarm 1 (IA1)	O		
J3-5	Inspection Alarm 2 (IA2)	O		
J3-6	Inspection Alarm 3 (IA3)	O		
J3-7	Inspection Alarm 4 (IA4)	O		
J3-8	Inspection Alarm 5 (IA5)	O		
J3-9	Inspection Alarm 6 (IA6)	O		
J3-10	Inspection Alarm 7 (IA7)	O		
J3-11	no connection			
J3-12	no connection			
J3-13	+24VDC (+VI)			
J3-14	+24VDC (+VI)			
J3-15	Inspection Alarm 8 (IA8)	O	See comments for Inspection Alarm 0-7 above	
J3-16	Inspection Alarm 9 (IA9)	O		
J3-17	Inspection Alarm 10 (IA10)	O		
J3-18	Inspection Alarm 11 (IA11)	O		
J3-19	Inspection Alarm 12 (IA12)	O		
J3-20	Inspection Alarm 13 (IA13)	O		
J3-21	Inspection Alarm 14 (IA14)	O		
J3-22	Inspection Alarm 15 (IA15)	O		
J3-23	no connection			
J3-24	no connection			

Terminal	Signal and Indicator LED label	Input (I) or Output (O)	Comments
J4-1	24VRET (-VI)		
J4-2	24VRET (-VI)		
J4-3	Not Processed 0 (NP0)	O	Pulses for 12 ms when a part is not processed due to a system malfunction (online mode only)
J4-4	Not Processed 1 (NP1)	O	
J4-5	Not Processed 2 (NP2)	O	
J4-6	Part Good 2 (PG2)	O	Group B outputs. See Extended I/O Configuration (on page 29)
J4-7	Part Bad 2 (PB2)	O	
J4-8	Part at Reject 2 (PAR2)	O	
J4-9	Reject Confirm Sensor Blocked (RCSB)	O	Reject confirm sensor signal pulse width exceeding programmed limit
J4-10	System Ready (RDY)	O	Steady state ON or OFF 24V. ON = lane is online, no critical alarms are triggered, and no lost communication. OFF = lane is offline, a critical alarm has been triggered, or communication is lost (example: part tracker communication lost).
J4-11	no connection		
J4-12	no connection		
J4-13	+24VDC (+VI)		
J4-14	+24VDC(+VI)		
J4-15	no connection		
J4-16	System State (SS)	O	Indicates whether the lane is online or offline. Online = active. Offline = inactive.
J4-17	Part Good (PG)	O	Pulses for 12 ms for each part declared good by the inspection
J4-18	Part Present (PP)	O	Pulses for 12 ms when the part present sensor detects a part
J4-19	Part Bad (PB)	O	Pulses for 12 ms for each part declared bad by the inspection
J4-20	Part at Reject (PAR)	O	Pulses for 12 ms for each part that crosses the reject point (online mode only)
J4-21	Print Statistics (PS)	I	Prints the lane statistics to currently configured printer or file Schedule Reports
J4-22	Clear Alarms (CA)	I	Clears the lane alarms
J4-23	Clear Statistics (CS)	I	Clears the lane statistics

Terminal	Signal and Indicator LED label	Input (I) or Output (O)	Comments
J4-24	Preform Alarm (PA)	I	Used only in special applications. Activated by the Preform Material Handling system.

Test Points

Function	Test Point
+3.3V	TP1
+3.3V Gnd	TP4
+24VDC (+VI)	TP2
24VRET (-VI)	TP3
+24VI	TP5
GNDI	TP6

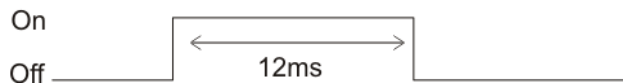
Extended I/O circuits

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:

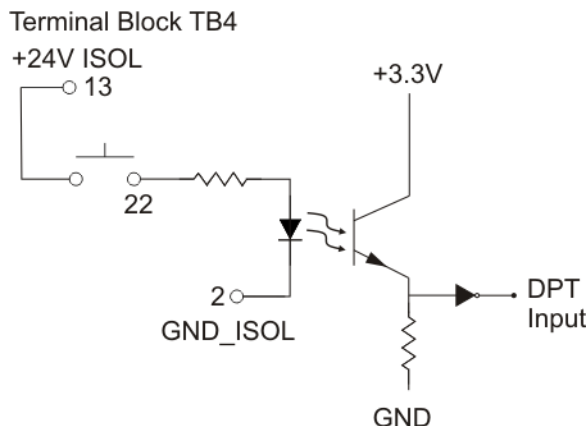
- Minimum dwell time of the **input** device is 1.1 ms
- Maximum **output** load is 50 mA
- Default value of **output** pulse is 12ms. Some output signals, such as alarms, must be cleared on the Intellispec before they turn off.

Default timing of pulsed output



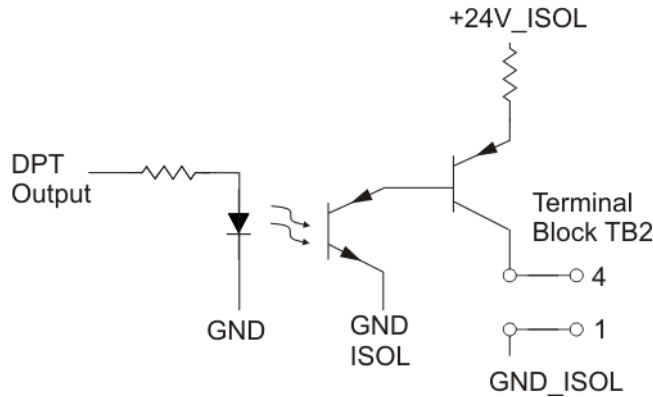
The following illustration shows a typical circuit that can be used to clear alarms.

CLEAR ALARMS - INPUT



The following illustration shows a typical circuit that can be used for a group output.


GROUP 1 - OUTPUT



Extended I/O Configuration

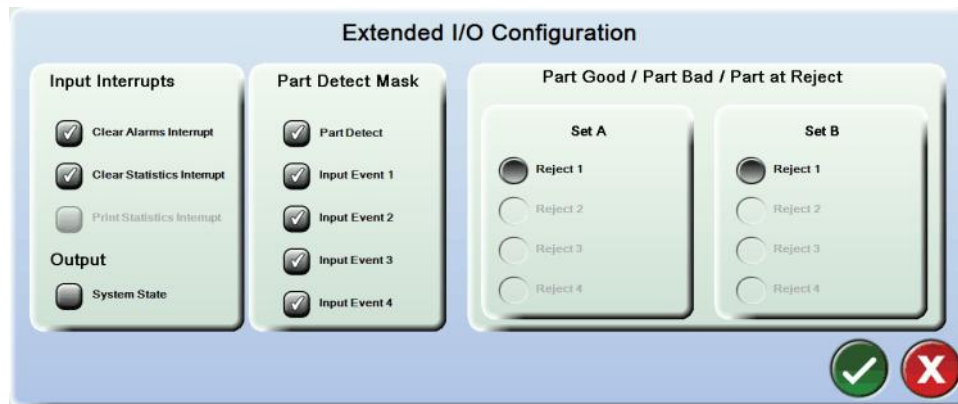
Enable input or output signals to perform a function on the Intellispec system or monitor the production lane in your plant. These settings must be done for each Extended I/O board for each lane.

See also the sections about **Extended I/O** (see "**Extended I/O board**" on page 21) and Extended I/O Signals in the Intellispec Hardware Guide.

To get to this screen: From Lane or Sensor Overview mode, select Tools  | **Hardware Setup** | **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 to perform the following functions.

Clear Alarms Interrupt

Clear the lane alarms.

Clear Statistics Interrupt

Clear the lane statistics.

Print Statistics Interrupt

Print the lane statistics to the currently configured printer or file. See also Schedule Reports.

Output

System State

An output pulse to notify your plant whether the lane is online or offline. Online = active. Offline = inactive.

Part Detect Mask

Choose which Part Detect or other input events to trigger the Part Present output on the Extended I/O board. This is an OR function. Any enabled Part Detect signal or Input Event that goes active will activate the Extended I/O Part Present output.

Part Detect

The signal goes active when the sensor detects a part.

Input Event N

The Part Tracker board accepts up to five* input events (Part detectors or other sensors). Part tracking is always controlled by the Part Detect signal (Input Event 0). You might use other input events (1 - 4) in your system to trigger the Part Present output signal.

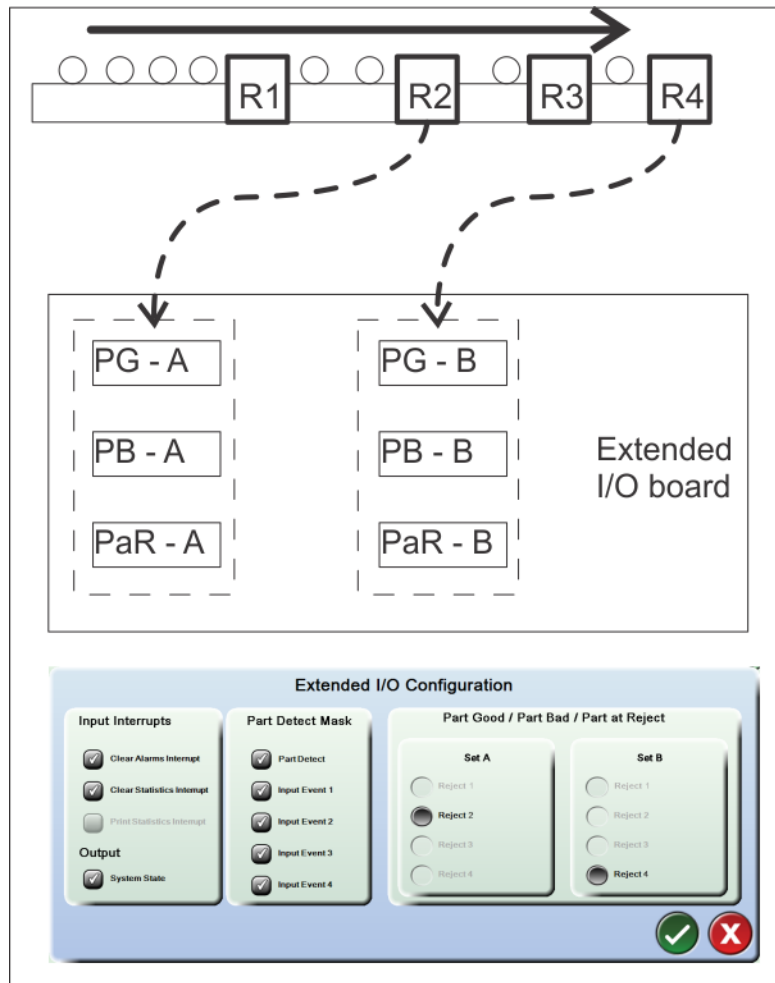
*Only if your system has an 8-channel Part Tracker board. If your system has a 2-channel Part Tracker board, then only one Part Detect signal is used. The other input events are not available.

Part Good/ Part Bad/ Part at Reject

Choose which rejector signal to activate the **Part Good**, **Part Bad**, and **Part at Reject** signals on the Extended I/O board. After a part is inspected, the system determines whether the part is good or bad. As the part passes by Rejector 1, 2, 3, or 4, the Part Good/ Part Bad/ and Part at Reject signals are activated on the Extended I/O board. There are two groups of Part Good/ Part Bad/ and Part at Reject signals - Group A and Group B. You choose which rejector is associated with Group A and/or Group B. You can have both groups associated with the same rejector, if desired. See Extended I/O signals.

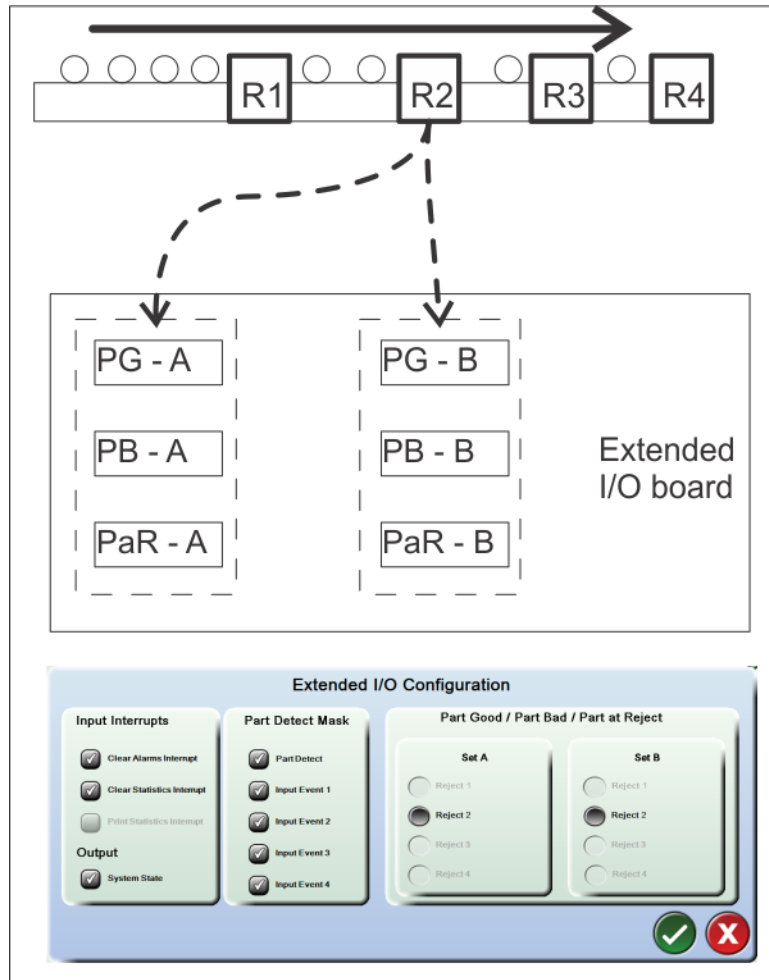
❖ *Note: If your system has a 2-channel Part Tracker board, then the lane has up to two rejectors. If your system has an 8-channel Part Tracker board, then the lane has up to four rejectors.*

Example 1 below: Group A is triggered when the part passes Rejector 2, and Group B is triggered when the part passes Rejector 4. The illustration below shows a basic block diagram with a conveyor with four rejectors. Those rejectors output a signal to the Extended I/O board, based on the Extended I/O configuration.



R	Rejector
PG	Part Good signal, Group A and Group B
PB	Part Bad signal, Group A and Group B
PaR	Part at Reject signal, Group A and Group B

Example 2 below: Group A is triggered when the part passes Rejector 2, and Group B is also triggered when the part passes Rejector 2.



Index

A

- ADJUSTMENTS • 11
- APERTURE AND FOCUS ADJUSTMENTS • 13

C

- CAP 360 INSPECTION MODULE • 5
- CAP 360 INSPECTION MODULE DIMENSIONS • 6
- CLEAN CAMERA WINDOWS • 15
- CLEAN OR REPLACE THE CAP 360 FAN FILTERS • 17
- CLEANING OPTICAL SURFACES • 15
- COMPONENTS INCLUDED IN THE CAP 360 MODULE • 6
- CONTROL BOARDS IN MODULE 77882 • 9

E

- EXTENDED I/O (OPTIONAL) • 21
- EXTENDED I/O BOARD • 21
- EXTENDED I/O CIRCUITS • 28
- EXTENDED I/O CONFIGURATION • 29
- EXTENDED I/O SIGNALS S6 • 22

F

- FUSES - DC/ DC CONVERTER MODULE • 9

G

- GLAND PLATE IN MODULE 77882 • 8

L

- LIGHTING ADJUSTMENTS • 14

M

- MAINTENANCE • 15

O

- OBSERVE THE PART IMAGE • 11

P

- PART CHANGEOVER - CAMERA HEIGHT ADJUSTMENT •
11
- PART TRACKER BOARD AND DC/ DC CONVERTER
MODULE • 7

W

- WIRING DIAGRAM - CAP 360 MODULE 77882W SHEET
1 OF 3 • 18
- WIRING DIAGRAM - CAP 360 MODULE 77882W SHEET
2 OF 3 • 19