INTELLIMASS™

Intellimass Series V Addendum

Pressco Technology Inc.

Part Number 69549 Rev. 04

Original Instructions

Written and designed at:

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Chapter 1

How to Contact Pressco

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Chapter 2

Introduction

Welcome!

Congratulations on your purchase of an Intellispec system with Intellimass sensing modules. This system provides online sensing of mass in various mono-layer plastic containers, nylon barrier in containers and preforms, and thickness in the panel area of various plastic closures.

About this manual

This manual discusses the entire Intellimass system, including the software interface and the hardware. Installation, troubleshooting, and maintenance information is provided in specific chapters.

We recommend a formal training class either in our classroom facilities in Cleveland, Ohio USA, or on-site at your facility. Please ***contact Pressco's*** (on page 2) training department for information about classes. This manual should be used as a reference after you have received training.

How to find information

Check the table of contents at the beginning of this manual, or the index at the end of this manual to quickly find subjects.

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

Electronic components can be damaged by static electricity discharge. Always observe the following precautions before removing, installing or handling any electronic components within the Intellimass System:

- Wear an anti-static wristband which is grounded to the 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.

What is Intellispec Mass?

The Intellispec Mass (or simply called IMASS) uses patented technology to provide online process monitoring of plastic bottle material distribution. The mass sensors work together with the bottle's unique structural shape to provide correct and accurate measurements. The complicated ribs, folds, and decorative structures of the bottles are integrated into the measurements so that an almost infinite number of bottle shapes can be accommodated with ease. Intellispec mass senses the mass of up to three areas of a mono-layer PET bottle. Out-of-tolerance containers are automatically rejected and defects may be correlated to key machine components.

See also ***How Mass sensing works*** (on page 8).

What is Intellispec?

Intellispec (or Ispec for short) is a high-speed machine vision system designed specifically for product and online process monitoring. It takes advantage of the latest developments in camera, lighting, and optics technologies, along with advanced algorithms. Out-of-tolerance containers are automatically rejected, and defects may be correlated to key machine components.

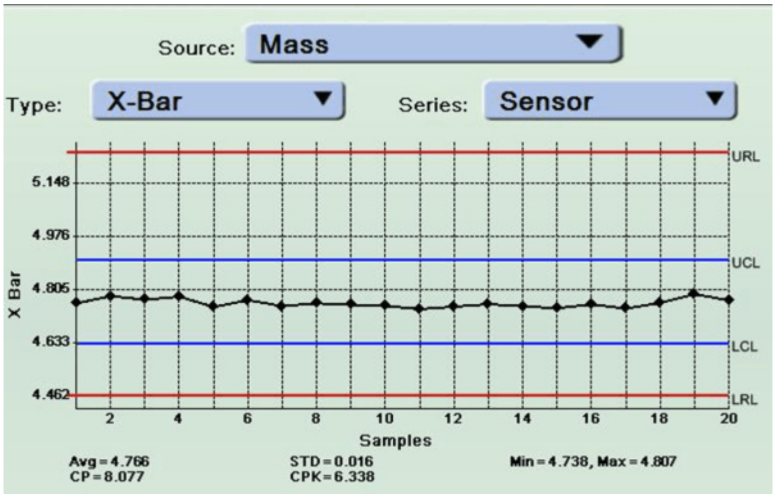
See the *Intellispec Programming Guide* and *Intellispec Hardware Guide* for more information about the Intellispec.

How Mass sensing works

The Intellispec mass sensor measures mass by measuring the amount of infrared (IR) absorption that occurs with a given bottle. We place an IR emitter and sensor on opposite sides of a bottle to measure the IR absorption of a bottle section. If the bottle section is heavier, we report a higher mass for that section and if it is lighter, we report a lower mass for that section.

Mass modules measure mass in sections of a bottle, typically a base and one or two sidewall sections. Note that every bottle is sensed as it passes by the mass modules.

The system is scaled by comparing the mass sensor reading to cut and weighed bottles. We then report the resulting average mass of each sensor on the screen, which is correlated to a machine component. Mass is compared to upper and lower limits set by the user and bottles are rejected if they fall outside of the limits. The graph (below) from the Intellispec software shows the average weight (in grams). Each data point represents the average of 10 samples.



What main components are included

The Intellispec mass system consists of a user interface, a control box, up to three sensor/ emitter pairs, and associated cabling and part tracking/ correlation sensors. Some of these components are installed inside the blow molder (if applicable). If you have an Intellispec with both cameras and mass sensors, the part tracking and correlation sensors are shared by both types of sensors.

For illustrations of the components, see ***Intellispec Mass System Block Diagram*** (on page 59) or ***Sensor and Emitter Configuration*** (on page 60).

Chapter 3

Understanding the Intellimass Graphs and Menus

Statistical Process Control (SPC) Graphing

This option is available if you have a sensor that measures specific data, or you have an inspection with "Record SPC Statistics" enabled.

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

The inspection from which the data is derived.

- For mass sensors, the only choice under Source is the mass inspection.
- For camera sensors, the choices for Source depend what inspections are included and enabled in the part program. Only the inspections that keep Retro-Spec Statistics have SPC graph data.
- For other sensors (such as X-Ray), the choice for Source depends on the available inspection(s).

Type

Select the type of graph. 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
- **Correlation** - the display of the average sensor values by individual cavity

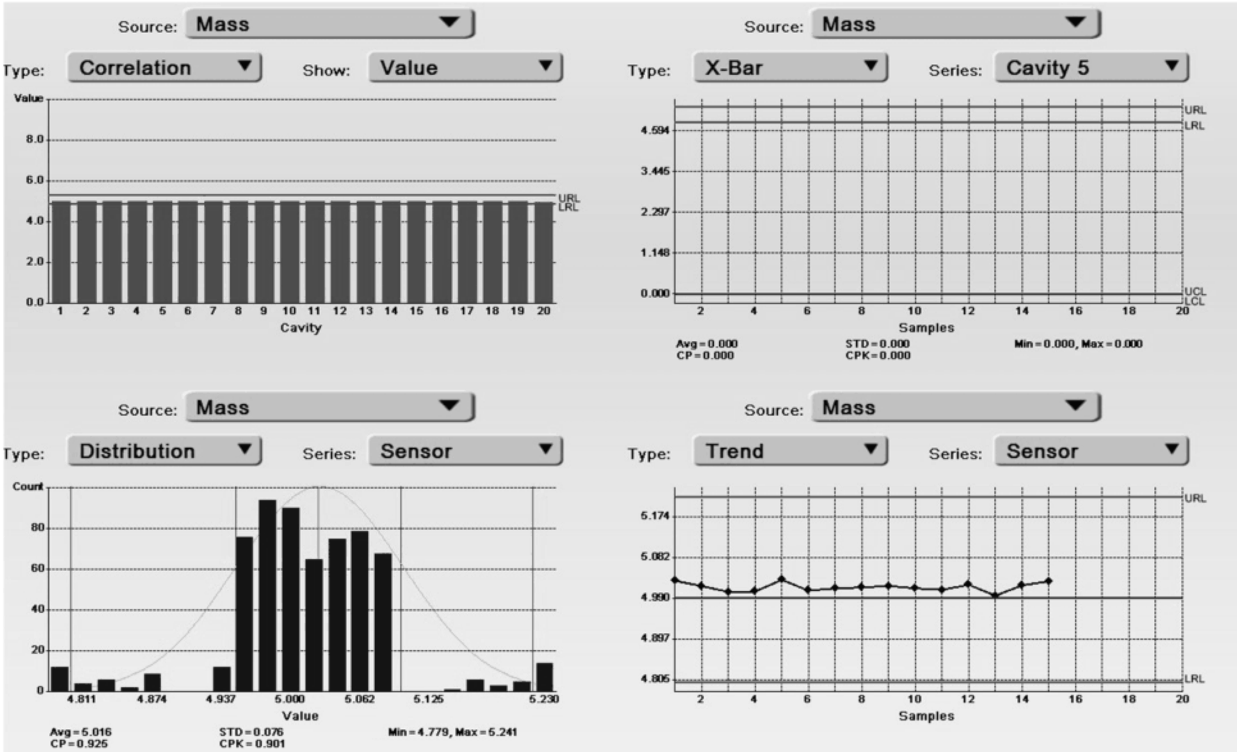
Series/ Show

On the first five graph 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.

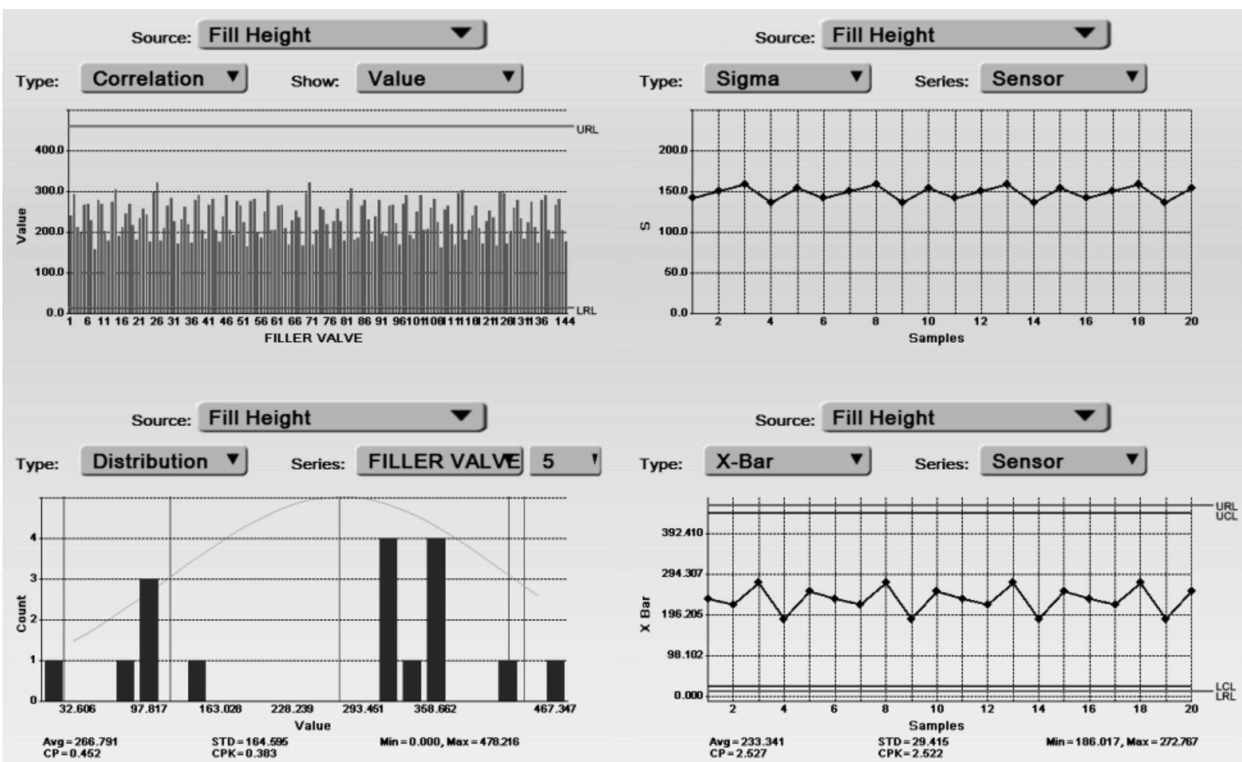
When the Correlation graph is selected, the **Show** category allows the selection of:

- **Value** - the average data value
- **Sigma** - the standard deviation
- **Defects** - a defect count from when the data was last reset

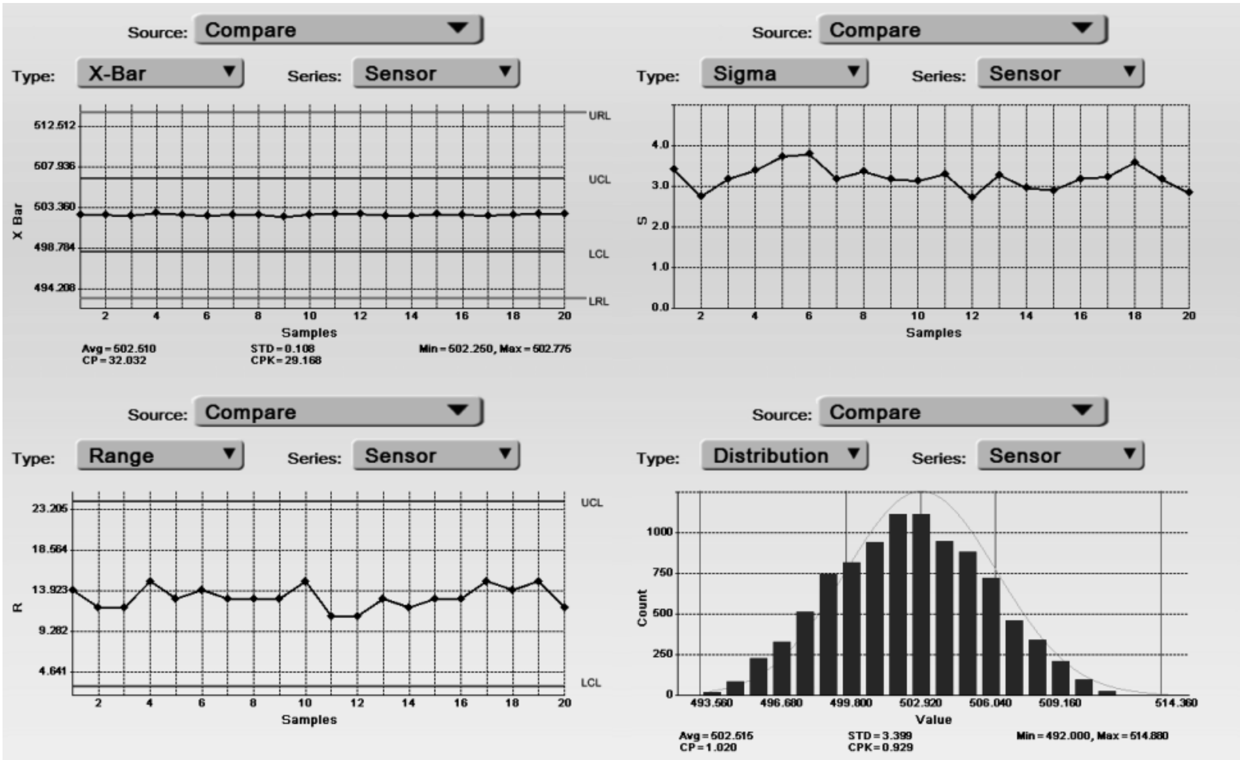
The picture below shows sample data from **mass** sensors.



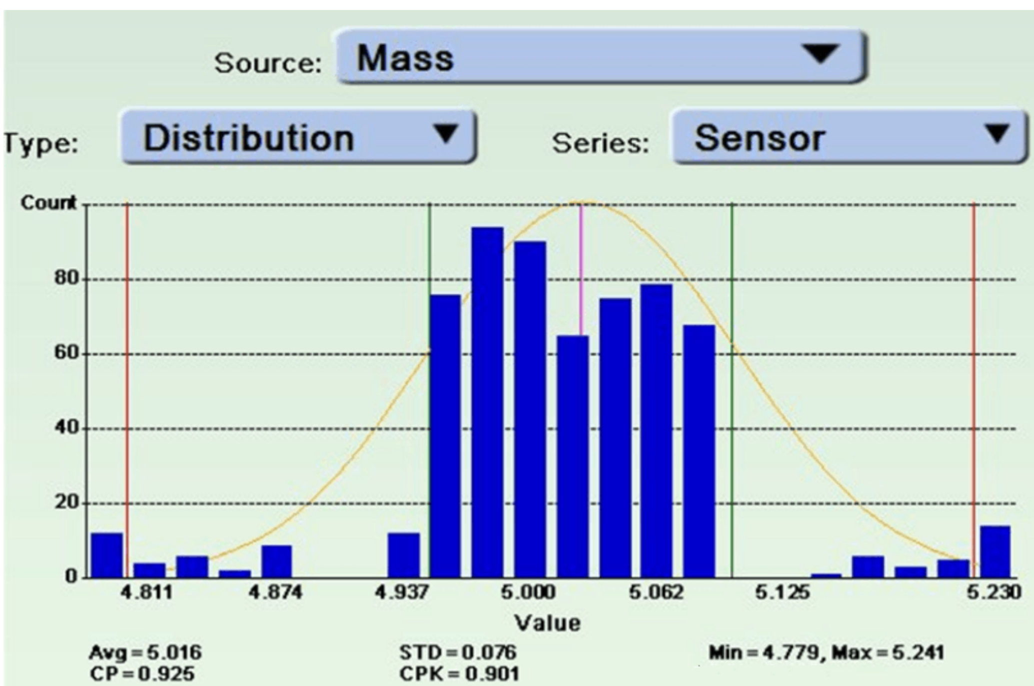
The picture below shows sample data from **camera** sensors.



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



About the Distribution and X-bar graphs

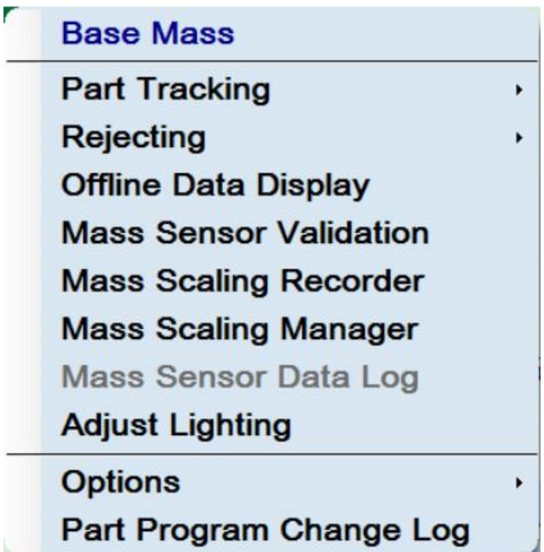


The values under the Distribution and X-Bar displays are described below:

- **Avg** is the average value measured for the selected sensor.
- **STD** is the standard deviation of the values measured.
- **Min and Max** are the minimum and maximum values measured.
- **CP** is a statistical value indicating how tightly grouped the data values are. Generally, the higher the value (closer to 2), the better the product or process.
- **CPK** is a statistical value computed from the inspection data values. These values show how well-centered the data population is within the reject specification. Generally, the higher the value (closer to 1), the better the product or process. Values below one indicate that variations in the process are too great to consistently produce acceptable products.

Mass Sensor Menu

The Mass Sensor Menu is similar to the Sensor Menu for cameras. However, a few items are specific to mass sensing.



Part Tracking

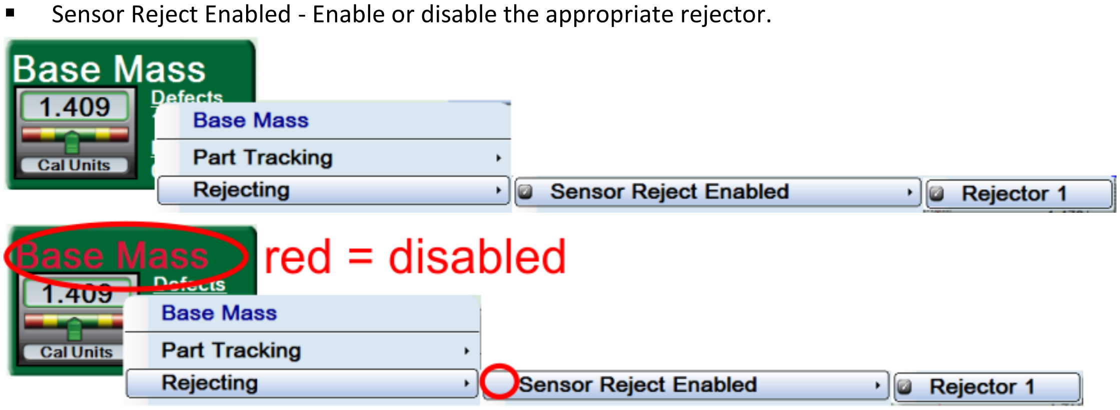
Opens Part Tracking options for:

- ***Mass Part Present Delay Calibration*** (on page 15)
- ***Advanced Part Present Delay Calibration*** (on page 18)
- ***Part Width Calibration*** (on page 22)

Rejecting

Opens rejecting options:

- Sensor Reject Enabled - Enable or disable the appropriate rejector.



- ***Reject Delay Calibration*** (on page 23)
- ***Reject Confirm Calibration*** (see "***Reject Confirm Calibration (Optional)***" on page 24)

Offline Data Display **(on page 26)**

This menu displays sensor readings when the lane is offline. It can be used for troubleshooting.

Mass Sensor Validation **(see "*Intellimass Sensor Validation (option)*" on page 51)**

Pressco offers an optional sensor validation kit (part number 76441) to test how well the mass sensors are working.

Mass Scaling Recorder

The Scaling Recorder allows you to enter sample data from cut and weighed bottles. This should be used about three times per week for maintenance. Recording this data does not update scaling, but Intellimass saves all information in files that can be used to update scaling at a later time. ***How to use the Scaling Recorder*** (on page 35)

Mass Scaling Manager

The Mass Scaling Manager selects appropriate Scaling Recorder sessions to scale the system. This tool is also used to scale the Intellispec Mass sensor values over time to continuously improve system precision and accuracy. ***How to use the Mass Scaling Manager*** (on page 38)

Mass Sensor Data Log **(on page 27)**

This is used to save mass sensor data to a file.

Adjust Lighting **(on page 27)**

The Intellimass lighting menu sets the light output of the mass emitters.

Options

Provides different inspection tree views.
Part Program Change Log - Display the Part Program Change Log. This lists the inspections and the edit history for each.

Mass Part Present Delay Calibration

Part Present Delay is the distance (in encoder pulses) from the part detect sensor to the center of the part. The Part Present Delay ensures that your part is in the center of the sensor when the system takes its samples. A Part Present Delay calibration needs to be done for each mass sensor in the system.

❖ *We recommend that you check Part Present Delay weekly.*

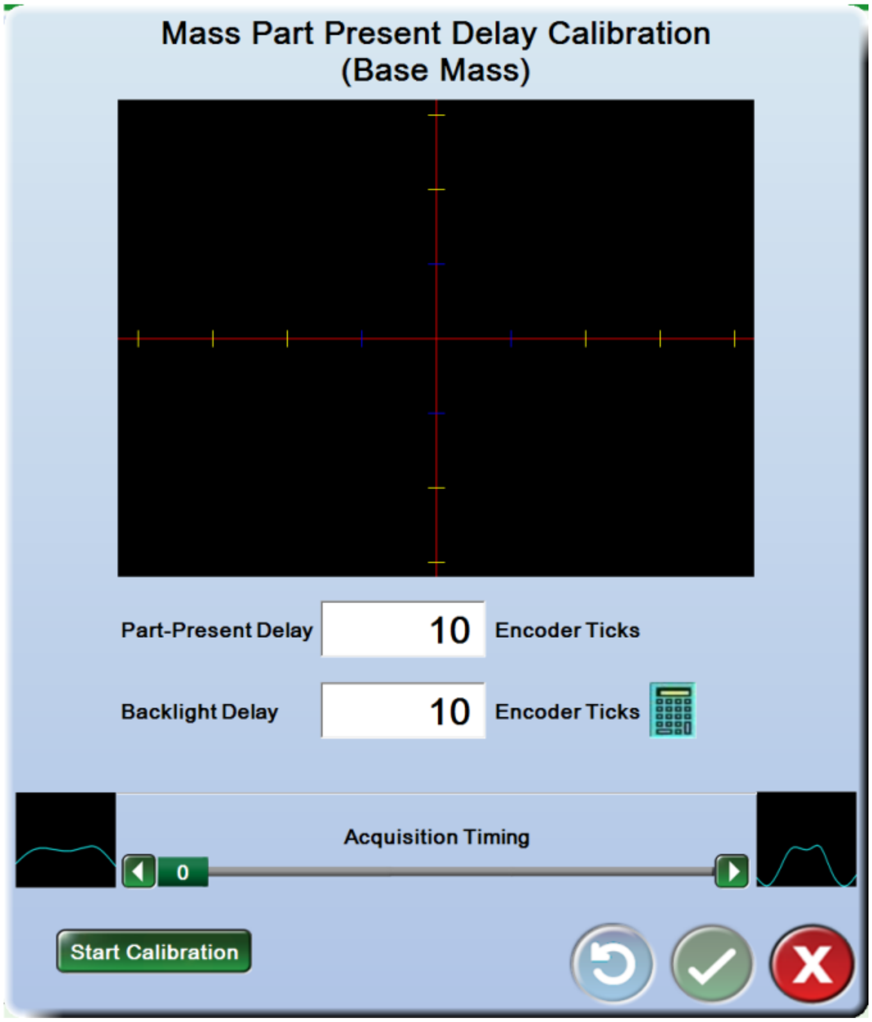
Important: ***Adjust Lighting*** (on page 27) before setting the part present delay.

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

❖ *Note: you can copy the Part Present Delay calibration values from a mass base sensor to a mass sidewall sensor when they are both mounted on the same fixed stand.*

➢ ***What you need:***

- parts running through the production line



➢ ***To calibrate the Part Present Delay:***

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

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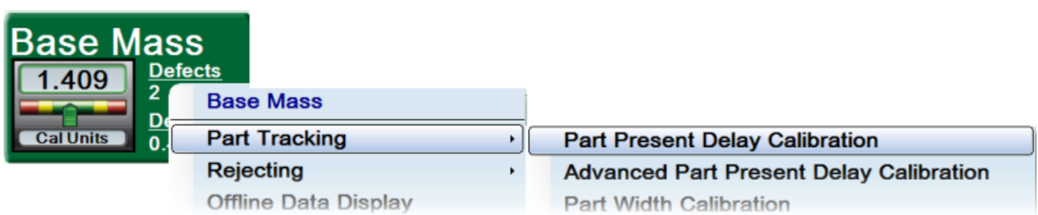
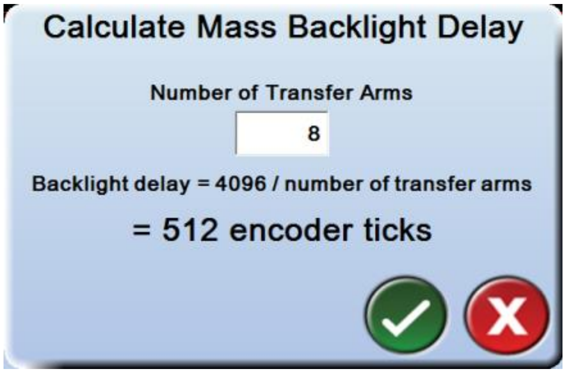
1. From the Sensor Overview mode, right-click on a sensor button to view the sensor menu.



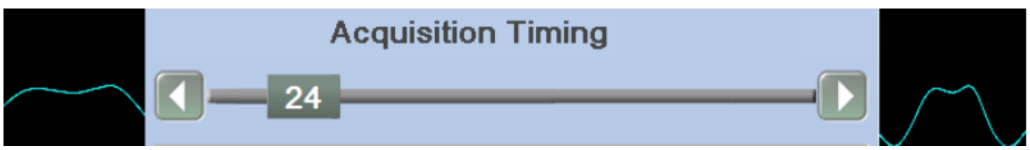
2. Select Part Tracking, then select Part Present Delay Calibration. The Mass Part Present Delay Calibration menu is displayed.
3. Enter your system's number of transfer arms to calculate Backlight Delay:

-  Select the calculator icon. The mass backlight delay calculator is displayed.

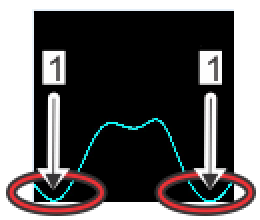


- Enter the number of transfer arms in your system. The system calculates the backlight delay.
- Select the OK button to save changes and exit.

4. Click the **Start Calibration** button.
5. Start running parts through the system. The Intellispec Mass sensor will take 31 samples of each part - the last 15 samples plus 16 more samples.
6. Manually adjust the **Part Present Delay** value until the waveform is centered. You should see a waveform that looks like something in between the left and right waveforms shown near the Acquisition Timing slider. An example is shown below: - *Good Acquisition Timing Waveform (on page 18).*



7. After you have adjusted Part Present Delay, click the **Stop Calibration** button.
8. Set the Acquisition Timing so that the displayed waveform omits the bottom half of the full curve and includes part of the slope on each side of the center plateau. The waveform should look like the *Good Acquisition Timing Waveform* (on page 18) shown below. This sets the acquisition point so that the gripper fingers are not part of the mass reading. The parts of the waveform that touch the bottom represent the gripper fingers (no light passes between the emitter and sensor).

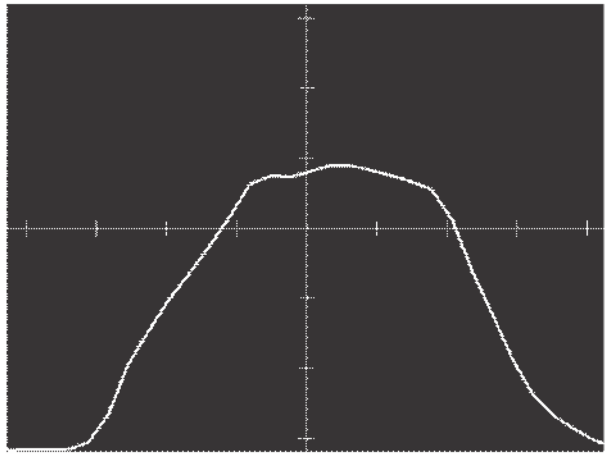


1 - gripper fingers

❖ *Note: Verify the waveforms from ALL of the transfer arms before proceeding. The molder transfer arms often have unequal spacing from arm to arm; therefore, you must ensure that the waveforms from all transfer arms meet the proper criteria.*

9. Select the OK button to save changes and exit. The Part Present Delay calibration values are saved and stored in a Lane configuration file.

Important: Set Acquisition Timing only once and leave it at the calibrated value. This value affects scaling. If you change Acquisition Timing after scaling the system, you will need to perform scaling again.



Good Acquisition Timing Waveform

Advanced Part Present Delay Calibration

Part Present Delay is the distance (in encoder pulses) from the part detect sensor to the center of the part. The Part Present Delay ensures that your part is in the center of the sensor when the system takes its samples. A Part Present Delay calibration needs to be done for each mass sensor in the system.

The **Advanced** Part Present Delay Calibration is used in some applications, where the part present delay waveform looks different than expected. An example of when this might be used is when you have Sidewall Mass sensors and emitters only - not Base Mass. In this case, the whole part present waveform is not displayed - only part of it is.

❖ *We recommend that you check Part Present Delay weekly.*

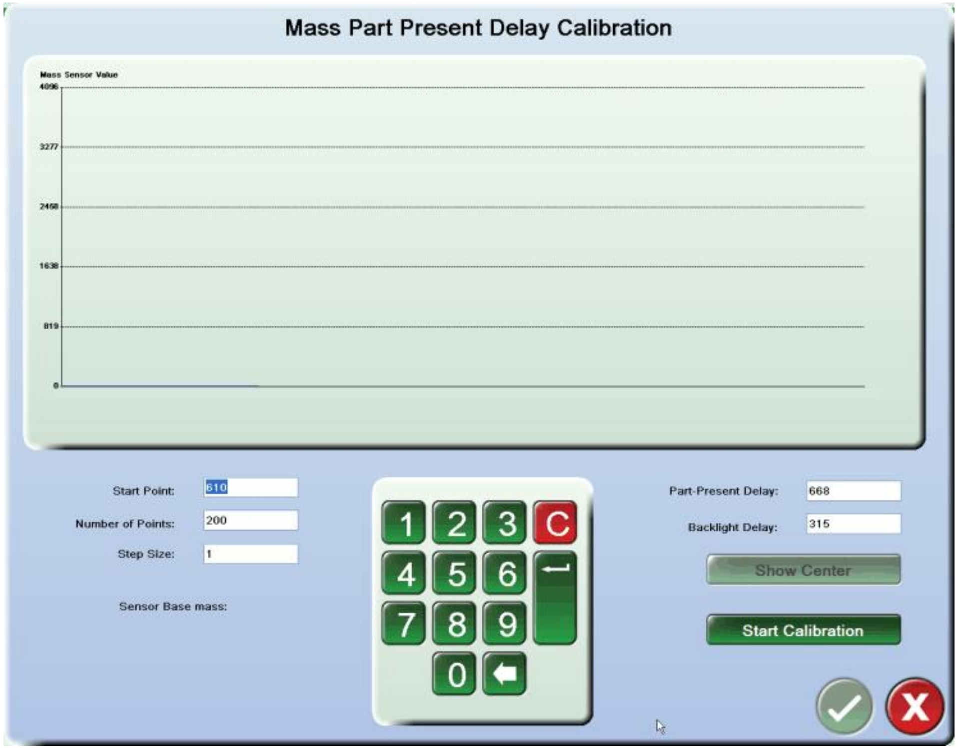
Important: ***Adjust Lighting*** (on page 27) before setting the part present delay.

This technique takes approximately two minutes to complete. It is slower than the standard ***Mass Part Present Delay Calibration*** (on page 15).

➢ ***To calibrate the part present delay:***

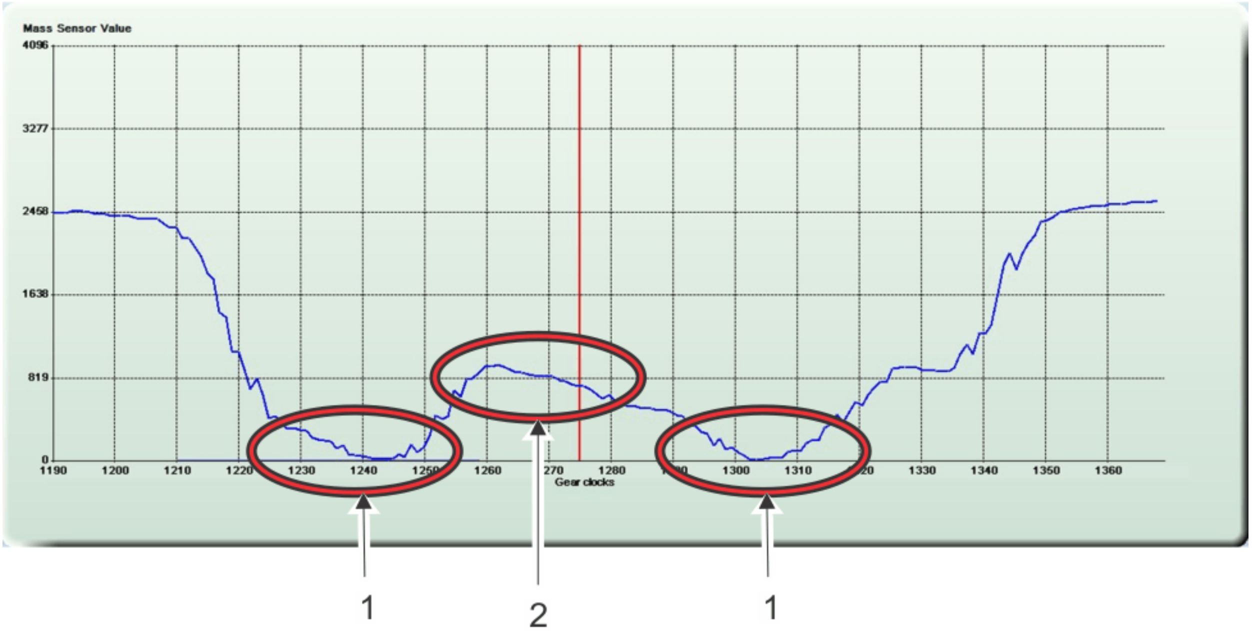
1. Make sure the lane is offline (the traffic light is red).

2. Right-click on the sensor button, select the Part Tracking option, then select **Advanced Part Present Delay Calibration**. The Mass Part Present Calibration screen will be displayed.



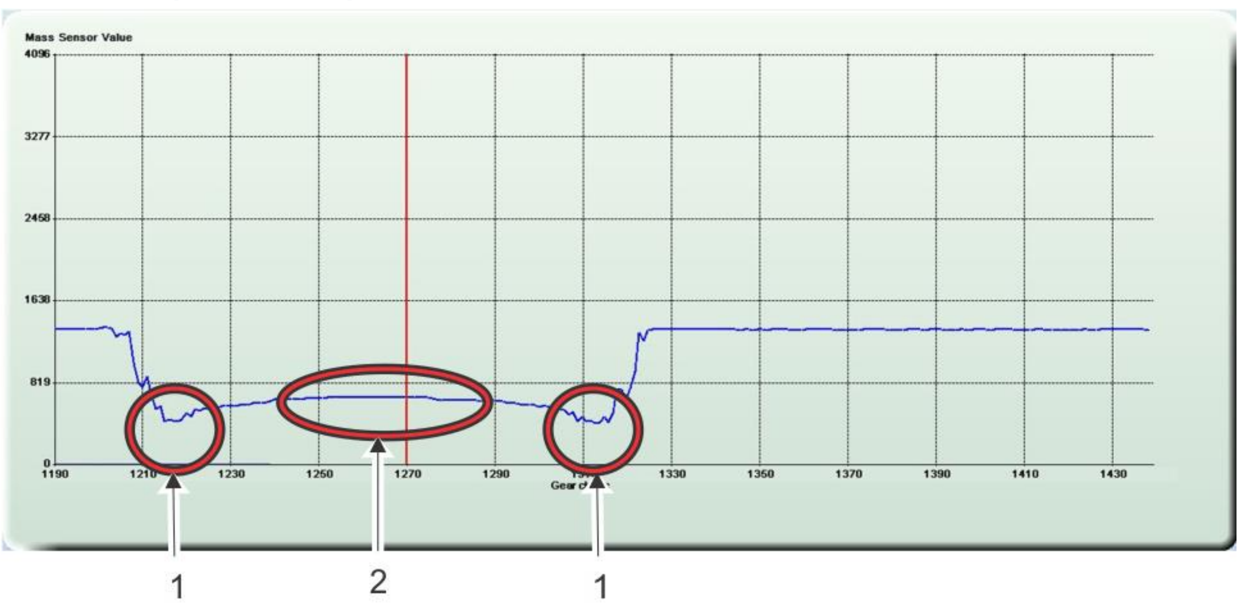
3. Set the parameters (Start Point, Number of Points, Step Size) if necessary. For information about these parameters, see ***Advanced Part Present Delay Calibration parameters*** (on page 21).
4. Make sure bottles are running through blow molder (or conveyor) and click **Start Calibration** to begin the calibration procedure. This could take several minutes and hundreds of bottles depending on the values entered. To cancel this procedure during acquisition, click **Cancel Calibration**. Otherwise, the system will continue to take measurements until all points have been plotted and the button will change back to **Start Calibration**.
5. A bottle profile should appear on the graph, similar to those shown below. If you cannot see all parts of the profile, consider calibrating again, but first change the Start Point, and possibly the Number of Points and/or Step Size to allow the entire profile to appear on the graph.
6. When a full bottle profile is displayed on the graph, click the **Show Center** button to compute the approximate Part Present Delay. The system will determine the approximate center of the bottle, using the profile. An example is shown below.
7. Place the cursor in the Part Present Delay box and enter a value using the on screen keyboard. You can use the value determined in Show Center, or use a value that better suits your application.
8. Click the OK button to save changes and exit the menu. Note: the OK button is grayed out until you change the value for Part Present Delay. If you want the value for Part Present Delay to remain the same, then click the exit button to cancel changes and exit.

Example base profile



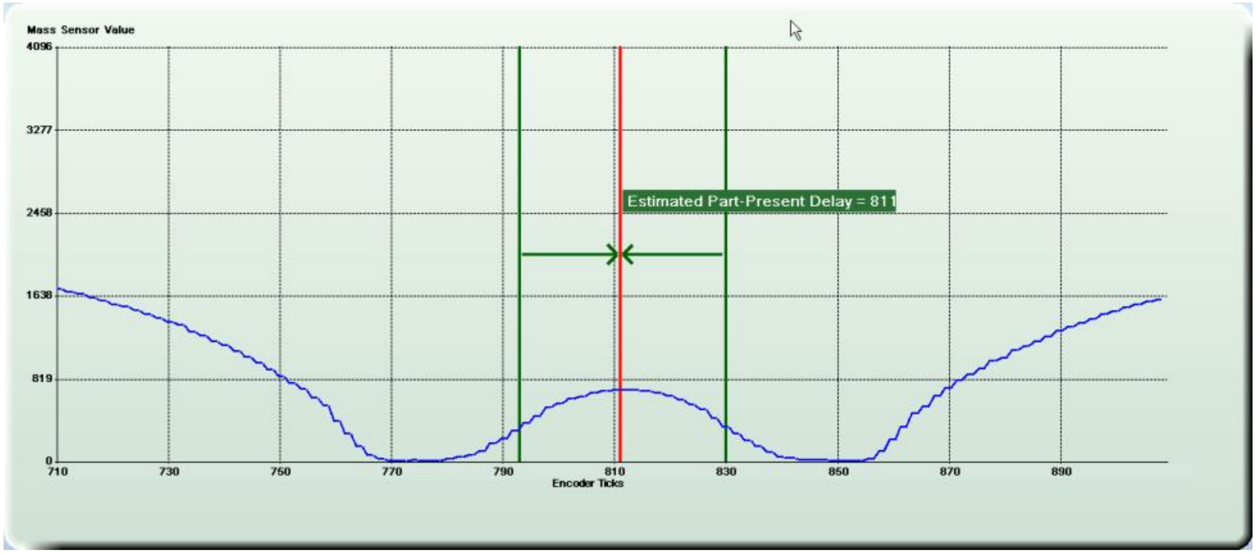
1	Gripper fingers - no light passing through the sensor
2	Gate area of the bottle

Example sidewall profile



1	Side of bottle
2	Middle of bottle

Example Show Center



Advanced Part Present Delay Calibration parameters

These parameters are used during the ***Advanced Part Present Delay Calibration*** (on page 18).

Start Point

The number of encoder pulses after the part detect (or part detect pulse from a PDX) that the system will start taking measurements. Pick a number lower than the estimated Part Present Delay, as the beginning of a range.

Step Size

Specify where the system should take the next reading. If Start Point is 1300 and Step Size is 1, the next reading will be recorded at encoder pulse 1301.

❖ *Note: It is best to use a step size of 1 to 3.*

Number of Points

Define the end of the range of measurements. If Number of Points is 250, the system plots 250 readings on the graph beginning at 1300 (Start Point), at increments of 1, and ending at 1550.

Part Present Delay

The number of encoder pulses from the part detect sensor to the center of the part. If a PDX is used, this is the number of encoder pulses from the part detect pulse out of the PDX to the center of the part.

The system can determine the approximate Part Present Delay through ***Advanced Part Present Delay Calibration*** (on page 18). Use the Show Center button to compute this value.

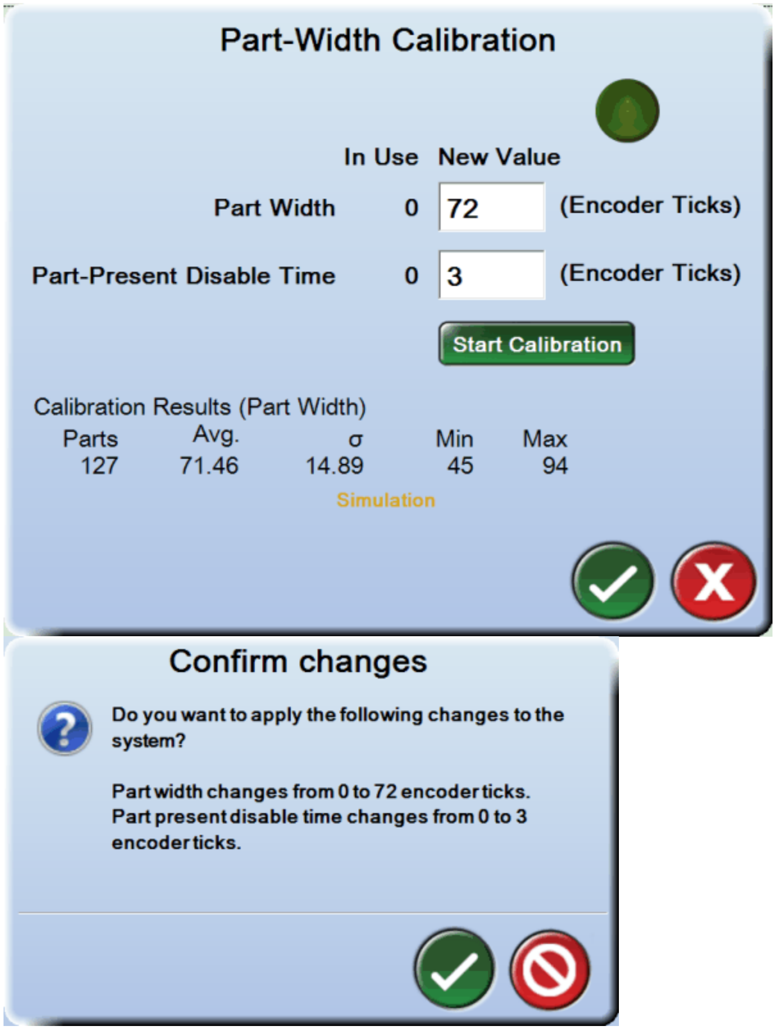
Backlight Delay

The Backlight Delay should be calculated with the following formula: Backlight Delay = [(8192 / number of transfer arms) / 2]. The system can calculate this for you in the screen: ***Mass Part Present Delay Calibration*** (on page 15).

Part Width Calibration

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

Mechanic level user and higher



➢ ***To calibrate the Part Width:***

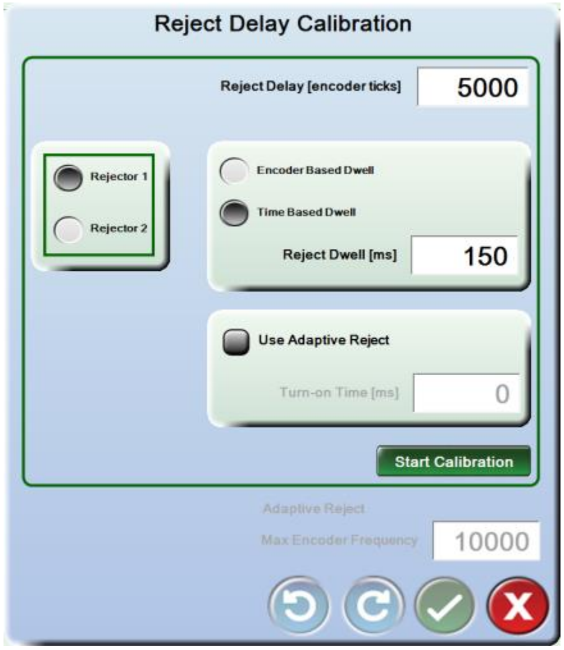
1. From Sensor Overview mode, right-click a sensor button | **Part Tracking** | **Part Width Calibration**.
2. With parts running under the camera or sensor, select **Start Calibration**. As each part goes by its width is displayed in Part Width field.
3. After a sufficient number of parts have gone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

Reject Delay Calibration

Calibrate the distance (in encoder ticks) from the part detect sensor to the rejector. This ensures that the correct part is rejected.

During Reject Delay calibration, the reject device will activate for each part. 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.



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

➢ ***To calibrate the Reject Delay:***

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

Reject 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 effectively rejected, and short enough to ensure that only one part is rejected for each reject pulse.

Adaptive Reject

Adaptive Reject (optional)

Reject Confirm Calibration (Optional)

Reject Confirm can detect missed rejects. It is used with the Missed Reject Alarm. There are two types of Reject Confirm sensors, and calibration is different for each. The type used in your process depends on your plant's needs.

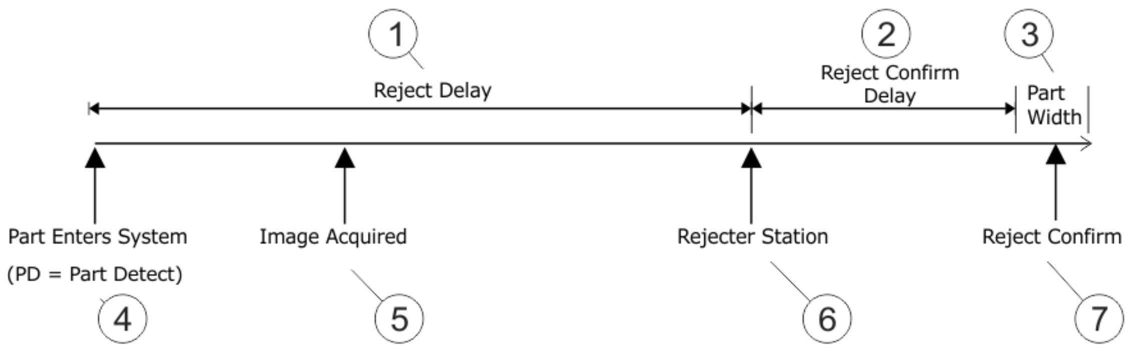
❖ *Note: Reject Confirm is an optional feature, and an additional sensor must be installed at your site.*

A. Encoder-based sensor

Reject Confirm uses a part detect sensor positioned past the normal reject mechanism to determine whether the defective part was rejected. Reject Confirm Delay must be a value of 1024 or less. This calibration method uses encoder ticks because the measurement is made along the same path as the parts.

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 (if enabled). Below is a timing diagram of the Reject Confirm process.



1) ***Reject Delay*** (see "***Reject Delay Calibration***" on page 23)

2) Reject Confirm Delay, set by Reject Confirm Calibration

3) ***Part Width*** (see "***Part Width Calibration***" on page 22)

4) Part Detect (PD) - where the part is first detected by the sensor

5) Image Acquired - image is taken, inspection is performed

6) Rejector Station - standard rejection point

7) Reject Confirm - second part sensor to determine whether a defective part was rejected

B. Time-based sensor

With this method of Reject Confirm, the part detect sensor is mounted in the path of the rejected products. This calibration method measures the reject confirm delay in milliseconds, because the product is flying through the air and not related to encoder ticks. If the Reject Confirm sensor does NOT see a part, then it triggers the Missed Reject alarm.

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

1 - Enable the Missed Reject alarm

Go to Lane Alarm Configuration to enable the Missed Reject alarm. If you are using **time-based reject confirm**, you may also want to enable the **Jam at Reject Confirm** alarm, which is triggered when the reject path has been blocked too long. That is, the reject bin may be blocked or full.

2 - Calibrate Standard Reject Delay

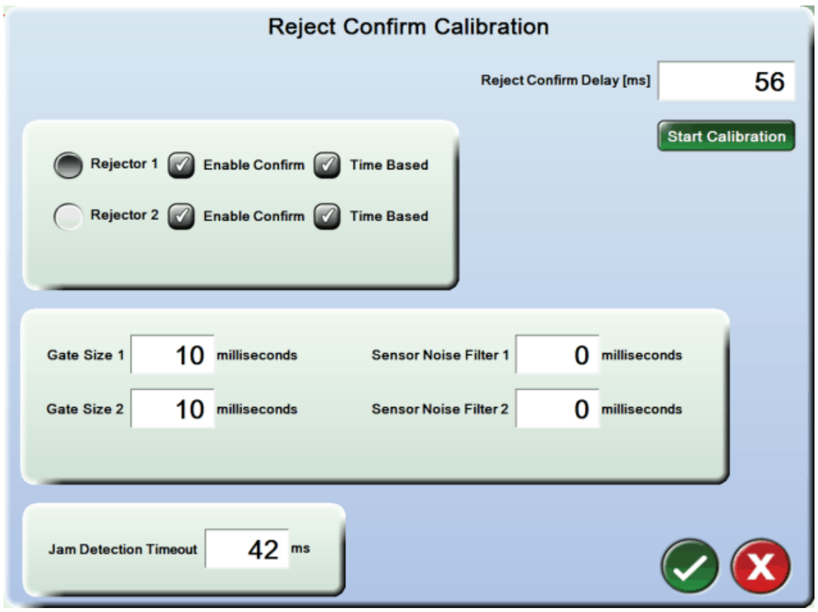
Calibrate the standard ***reject delay*** (see "***Reject Delay Calibration***" on page 23) using normal procedures.

3 - Set up Reject Confirm

Using encoder-based 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 ticks per inch, and the sensor is mounted five inches beyond the rejector, the Reject Confirm Delay would be set to 350. When the Reject Confirm sensor sees a part that is not supposed to be there, it triggers the Missed Reject alarm.

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

Using time-based Reject Confirm: Mount the Reject Confirm sensor so that it can see parts after they are rejected. For example, in the reject chute. If the sensor is closer to the rejector, less gate and dwell time is needed. If the Reject Confirm sensor does NOT see a part, then it triggers the Missed Reject alarm.



➢ ***To calibrate Reject Confirm:***

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

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

Gate Size

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

Sensor Filter

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

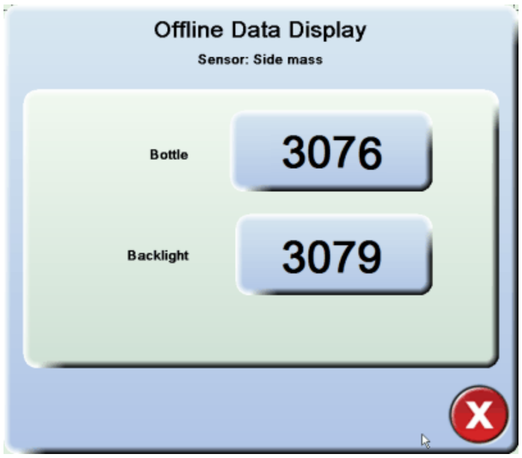
Jam Detection Timeout

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

Offline Data Display

This menu displays sensor readings when the lane is offline. It can be used for troubleshooting.

To get to this menu, right-click over a sensor button | **Offline Data Display**.

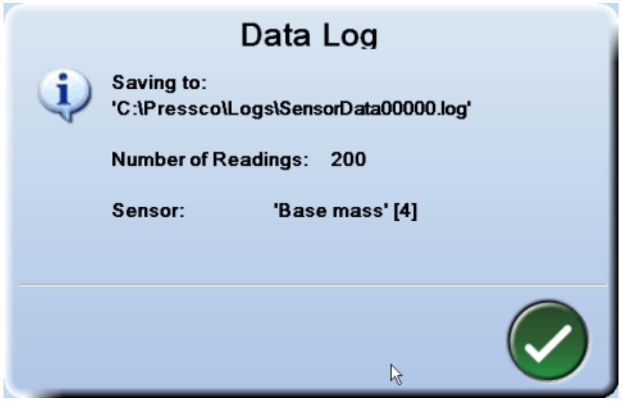


Notes about using this screen:

- The sensor has the capability of using different gain for backlight than bottle readings. This will be used for special applications. As of this publication, these numbers should be close in value.
- These readings are made in a free-running (asynchronous) manner. If bottles are running past the sensor, the readings will jump around and be meaningless.
- When the blow molder (or conveyor) is stopped and there is nothing between the sensor and the backlight, you should see similar numbers.
- If you put an object between the sensor and backlight, the Bottle number should change. If you do not see a change in these numbers under these different conditions, this could indicate that something is not set up correctly, or there is a problem with the hardware. ***Contact Pressco*** (on page 2) Service Department or Technical Support for assistance.
- The sensor readings (with something in front of the sensor) can vary between 0 and 4078.
  - If you see a number greater than 4000, this indicates a problem with the lighting setup. Refer to ***Adjust Lighting*** (on page 27).
  - If you see a reading of zero, check to see whether any object besides a bottle is blocking the sensor. If not, ***Contact Pressco*** (on page 2) Service Department or Technical Support for assistance.

Mass Sensor Data Log

This option is available from the mass Sensor menu when the lane is online (the traffic light is green). When you select the Mass Sensor Data Log option, the Intellimass logs mass sensor readings to a file on the disk. The number of readings and location on the disk are noted in the dialog box that is displayed when this function is selected.



Adjust Lighting

The first step to setting up an Intellispec Mass sensor is to set up the lighting. At first, lighting will be disabled. You must adjust lighting for each sensor.

➢ ***To set up lighting:***

1. Make sure the blow molder (or conveyor) is stopped, and that nothing is between the mass sensor and emitter.

2. Go to the Mass Lighting menu: From Lane Overview or Sensor Overview mode, right-click the sensor button to see the ***Mass Sensor Menu*** (on page 14) > then click Adjust Lighting. The Mass Lighting menu is displayed.

3. Click the **Auto Set** button from the menu. Wait approximately 60 seconds while the system takes readings and calibrates the sensor to apply an even distribution of zones. When the system is finished, the buttons will become active again.
4. Lighting setup is complete. Click OK to accept the lighting values and exit the menu.
5. Repeat lighting setup for each of the other mass sensors in the system.

For more information about lighting zones, see:

- ***Sidewall Mass Emitter Lighting Zones*** (on page 63)
- ***Base Mass Emitter Lighting Zones*** (on page 62)

For information about **Alarm Level**, see ***Maintenance alarm for lighting levels*** (on page 28).

Maintenance alarm for lighting levels

The Intellimass system has an alarm that is triggered when the sensors and emitters need to be cleaned. It is triggered when the lighting measurement falls below a threshold.

Important: This alarm indicates that you must clean the sensors and emitters. See ***Maintaining Sensors*** (on page 49) and ***Maintaining Emitters*** (on page 50).

➢ ***To set the alarm threshold:***

1. From Lane Overview or Sensor Overview mode, right-click the sensor button > Adjust Lighting.

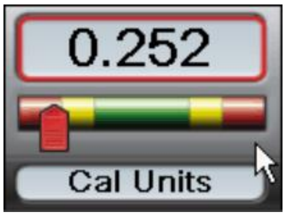
2. Set the Alarm Level to a number slightly lower than the value computed after you ***Adjust Lighting*** (on page 27), as shown in the example below. This allows a small variation in light level before you need to clean the sensors and emitters.

When the measured light level goes below the **Alarm Level** value, the mass lighting alarm is triggered. When you select the **Alarm** button, the alarm screen is displayed. An example is shown below. Clean the sensors and emitters.

Select the name of the alarm "Mass Lighting" to see details about the alarm, as shown below.

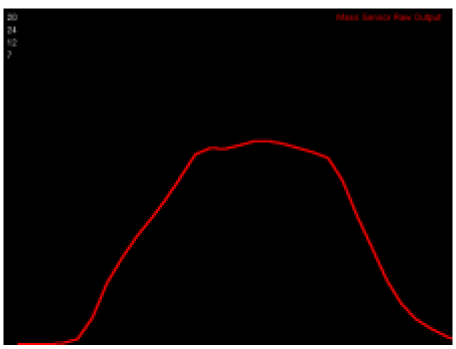
Reject Images for Mass sensing

These small graphs are displayed if a part has failed. The pointer underneath the graph indicates whether the part failed because it exceeded or did not meet specifications. If you change limits in your part program, the graphs and pointers will reflect the new reject settings after the Intellispec screen is refreshed.



❖ *Note: "Cal. Limits" is displayed before you scale your sensors. After scaling, the graph reflects your desired unit of measure.*

When you click one of the Reject Image icons, you will see a measurement waveform displayed in the image area.



Chapter 4

Setting Up Intellimass Sensors For the First Time

Cal. Units vs. Grams

When you first install Intellispec Mass sensors, the units displayed on the system are in Cal. (Calibration) Units. You will scale the sensor to allow the system to display measurements in grams. See ***Scaling the Intellimass sensors*** (on page 35).

Sequence for Setting up a Mass Sensor

The sequence of steps to set up a mass sensor are:

Sequence	Setup Procedure	Link in this manual
1	Add inspections	***Inspections for Intellimass*** (on page 43)
2	Adjust lighting	***Adjust Lighting*** (on page 27)
3	Set up Part Present Delay	***Mass Part Present Delay Calibration*** (on page 15) or ***Advanced Part Present Delay Calibration*** (on page 18)
4	Set up Acquisition Timing (only if you used Advanced Part Present Delay Calibration for Sequence #3)	***Mass Part Present Delay Calibration*** (on page 15)
5	Adjust the inspections	***Inspections for Intellimass*** (on page 43)
6	Perform Scaling	***Scaling the Intellimass sensors*** (on page 35)

Chapter 5

Scaling the Intellimass Sensors

Scaling is the process of mapping the mass sensor calibrated readings to reflect actual bottle section weights. It changes **Cal. Units** to **Grams** on the Intellispec interface.

❖ *Note: It is up to your plant whether you want to scale the system. If you choose not to scale, then the Intellimass will report data in Calibration units.*

Intellispec reports data in two different forms:

- **Calibration units** – The sensors are factory calibrated using a set of flat PET standards of known mass. Prior to scaling, the Intellispec reports mass data as calibration units.
- **Section weight** – Bottles are cut and weighed, then the data is imported into Intellispec. After scaling, Intellispec maps the calibration values into section weights.

Important: If you have already scaled the sensors and subsequently changed the Acquisition Timing value in ***Mass Part Present Delay Calibration*** (on page 15), you must scale the sensors again for every part program. Normally, the Acquisition Timing needs to be set only once.

What tools to use to scale the sensors

There are two software tools available. Run these tools in this order:

1. Scaling Recorder: This provides data sets to scale the system; however one session is not enough to scale the system. ***How to use the Scaling Recorder*** (on page 35)
2. Mass Scaling Manager: This selects appropriate Scaling Recorder sessions to scale the system. ***How to use the Mass Scaling Manager*** (on page 38)

You must run both of the above to scale the system, and you must scale each sensor in the system (you can add data for multiple sensors at one time). Scaling must be performed for every part program.

How to use the Scaling Recorder

The Scaling Recorder allows you to enter sample data from cut and weighed bottles. This should be used about three times per week for maintenance. Recording this data does not update scaling, but Intellimass saves all information in files that can be used to update scaling at a later time.

To get a proper spread of data, adjust the molder to produce a set of heavier than normal bottle sections for one Scaling Recorder session, a set of lighter than normal bottle sections for another Scaling Recorder session, and also include a set of normally produced bottle sections for a Scaling Recorder session. For best results, create bottle sections +/- 10% of nominal. If you can only adjust in one direction (example, heavier bottles) then create 10% and 20% heavier bottle sections than nominal. The objective is to get a good line fit in the Mass Scaling Manager.

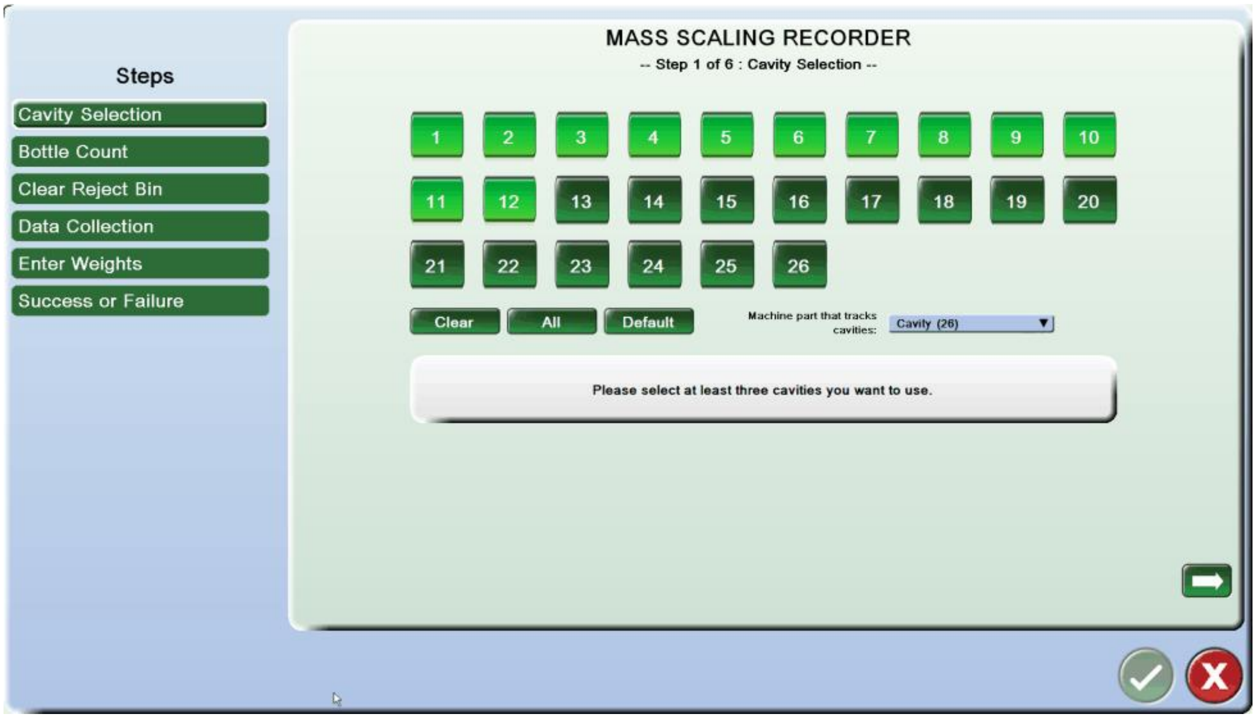
❖ *Note: If the Scaling Recorder and Mass Scaling Manager have not yet been completed for the current part program, the Intellispec readings will be in calibrated units; otherwise they will be in mass units.*

➢ ***To start the scaling recorder wizard:***

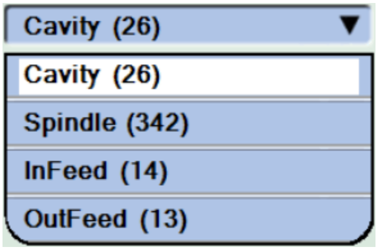
1. For best results, make sure the Lane is offline (the red traffic light is displayed). You may run the Scaling Recorder while the lane is online; however, when you collect the rejected bottles to cut and weigh them, you may find parts in the reject bin that were rejected because they were defective and not rejected for cutting and weighing purposes.

2. Right-click on one of the mass sensor buttons and select **Mass Scaling Recorder** from the Sensor menu. Note that the scaling recorder collects information from all mass sensors configured in the selected lane.

❖ *Note: if you previously clicked the Suspend button during a Scaling Recorder session, you will be returned to the Step 5 (Enter Weights) screen.*

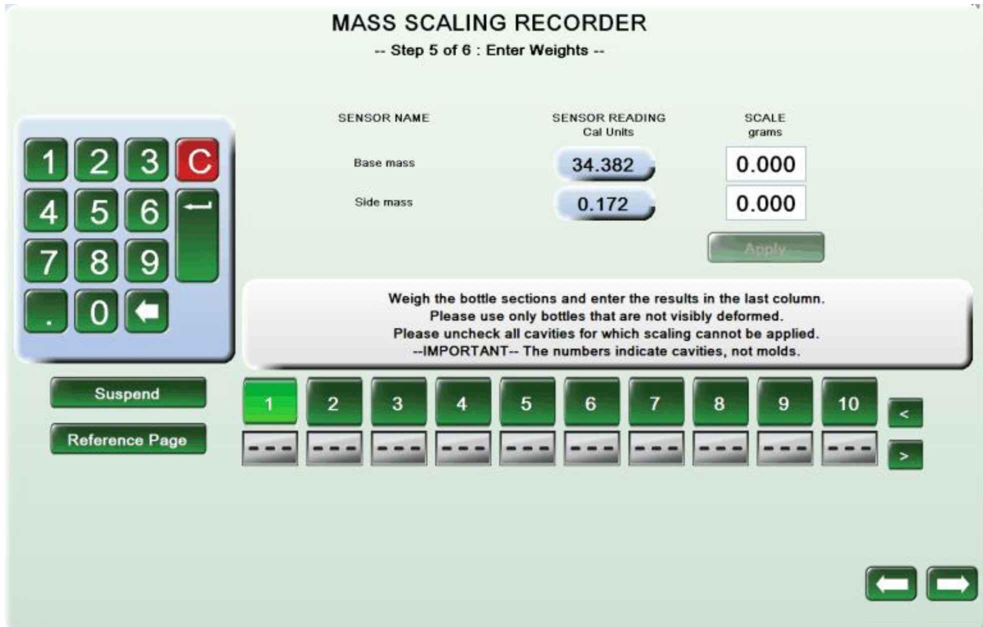


3. **Select cavities**: Use the numbered buttons to select the cavities from which to reject bottles. You must select at least three cavities. If the button is light green, the cavity is selected. If the button is dark green, it is not selected. If the blow molder is not producing bottles in a particular cavity, make sure that cavity is not selected.
4. **Select a machine part**: From the drop-down menu in the Step 1 screen, select the machine part that tracks the cavity/ mold in the blow molder.

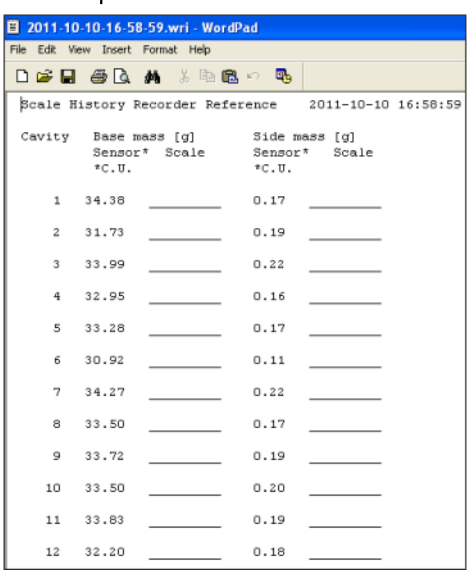


5. Click the right arrow to continue to the Step 2 screen.
6. **Set Bottle Count**: Set the number of bottles you want to reject from each of the selected cavities chosen in the Step 1 screen. For best results, use one bottle per cavity with a greater number of cavities instead of several bottles from a small number of cavities. Ideally, you should have 10-20 bottles rejected.
7. Click the right arrow to continue to the Step 3 screen.
8. Clear the reject bin as indicated on screen.

9. Click the right arrow to continue to the Step 4 screen. The system will take measurements from the appropriate bottles, perform a cavity dump, and then move automatically to the Step 5 screen.



- The Step 5 screen is where you will cut and measure bottles and **enter weights** of the cut sections.
- If desired, click the **Suspend** button to resume Intellispec operation while you cut and weigh bottles.
- If you have a printer attached to the system, click the **Reference Page** button to view and print a reference page. This shows how much weight Intellispec has reported for the section* and provides space to record the bottles' section weights after you have cut them. If you do not have a printer attached, you can save the page to a file then copy it and print it from another computer. *C.U. indicates calibration units.



Scale History Recorder Reference 2011-10-10 16:58:59

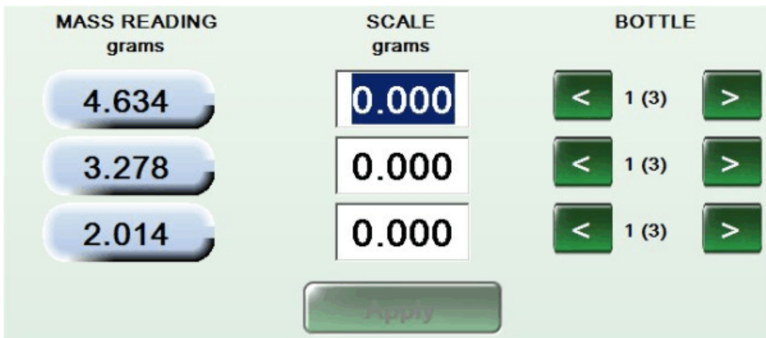
Cavity	Base mass [g] Sensor* *C.U.	Base mass [g] Scale	Side mass [g] Sensor* *C.U.	Side mass [g] Scale
1	34.38	______	0.17	______
2	31.73	______	0.19	______
3	33.99	______	0.22	______
4	32.95	______	0.16	______
5	33.28	______	0.17	______
6	30.92	______	0.11	______
7	34.27	______	0.22	______
8	33.50	______	0.17	______
9	33.72	______	0.19	______
10	33.50	______	0.20	______
11	33.83	______	0.19	______
12	32.20	______	0.18	______

10. Collect the rejected bottles from the reject bin.
11. Take the bottles to a bottle cutting station. See ***Recommended practices for cutting and weighing bottles during scaling*** (on page 41).
12. Cut and weigh each bottle section, writing the weight corresponding to each sensor in the appropriate space on the Reference Page.

13. If you clicked **Suspend** while you were cutting bottles, then return to the Scaling Recorder by right-clicking on a sensor button, then choosing **Mass Scaling Recorder** from the Sensor menu.
14. **Enter the weighed values**: Click one of the Cavity buttons at the bottom of the screen. Place the cursor in one of the boxes under "Scale grams," and use the on-screen keyboard to enter your weighed values, in grams. These are the values you wrote down for each cavity on the Reference Page. Enter values for all mass sensors configured in the current lane.
15. Click the **Apply** button. A check mark is displayed under the current cavity number, and the next cavity button is highlighted for you. Enter the weights from the next cavity. Continue to enter the weights for all cavities.

- 

NOTE: Only enter values for bottles that were not visibly deformed. If you have a cavity for which you cannot enter values, then click the box underneath the cavity number. It will toggle to an 'X' to indicate that the cavity will not be used in the session.
- If more than one bottle per cavity was selected, additional controls will be displayed to allow selection of which bottle per cavity to enter. Enter values for each bottle for each cavity.



16. Click the right arrow to continue. The Intellispec displays a Success or Failure screen (Step 6 screen), showing a correlation value. At this point, you can click the left arrow to go back and correct measurements if desired.
    - A correlation value of approximately 80% or higher is an acceptable value.
    - If the correlation values are lower, then click the left arrow button to go back and check to see if your numbers were entered correctly.
17. If you are satisfied with the Success/ Failure results, click the OK button to save changes and exit the screen.

This data will be stored with the part program. You will use this data in the Mass Scaling Manager to update scaling.

How to use the Mass Scaling Manager

The Mass Scaling Manager selects appropriate Scaling Recorder sessions to scale the system. This tool is also used to scale the Intellispec Mass sensor values over time to continuously improve system precision and accuracy.

Notes about using the Mass Scaling Manager:

- You must use both Scaling Recorder and Scaling Manager to scale the system.
- We recommend that you run the Scaling Recorder at least two or three times before using the Scaling Manager for the first time.
- To get a proper spread of data, adjust the molder to produce a set of heavier than normal bottle sections for one Scaling Recorder session, a set of lighter than normal bottle sections for another Scaling Recorder session, and also a set of normally produced bottle sections for a Scaling Recorder session.

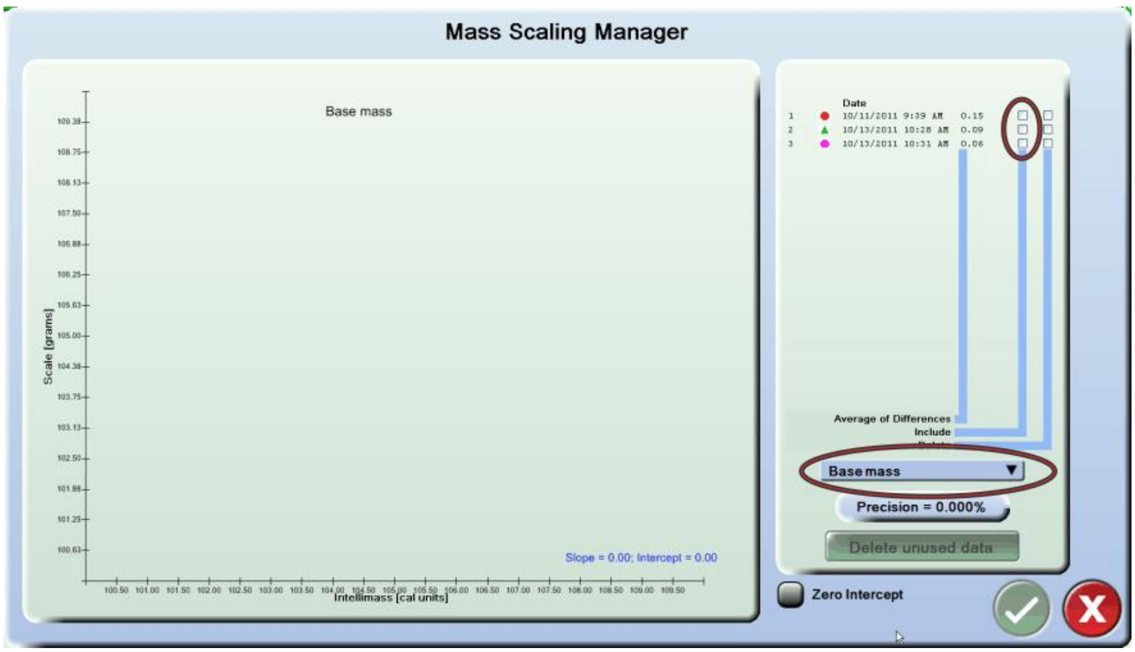
❖ *Note: if you have not already used the Scaling Recorder to record weights from cut and weighed bottles, you must do that before you use the Scaling Manager.* **How to use the Scaling Recorder** *(on page 35)*

Use the Mass Scaling Manager:

- When you first install the system, after using the Scaling Recorder
- To update scaling periodically, after using the Scaling Recorder, to get the latest data

➢ *To use the Mass Scaling Manager:*

1. Right-click on one of the mass sensor buttons and select Mass Scaling Manager from the Sensor menu. The Mass Scaling Manager graph is displayed.



2. If you have run the Scaling Recorder previously, you will see a set of check boxes in the upper right corner of the screen. Click the check boxes to **include** the appropriate Scaling Recorder sessions* for the currently selected sensor.
3. Click the drop-down menu in the right side of the screen to select another sensor.
4. Click the check boxes to **include** the appropriate Scaling Recorder sessions* for the currently selected sensor.
5. The Intellispec plots data points corresponding to each Scaling Recorder measurement that you entered. A Slope and an Intercept value is computed.
6. If you have only a few Scaling Recorder sessions to use (for example, when you are first setting up the system), then you may check the **Zero Intercept** box. This provides a data point at (0, 0) to the line fit to provide more accurate scaling.

❖ *Note: using the **Zero Intercept** value is only appropriate when you have just one or very few Scaling Recorder sessions without enough data to properly scale the system. Intellimass readings will only be accurate within a very small range (example, from 1.9 - 2.0 grams).*

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7. After you have selected all the appropriate Scaling Recorder sessions for the sensor (or all sensors), click the OK button  to save the data and exit. **The Intellimass is now scaled**. It will provide readings in grams instead of Cal. units.

❖ *Note: If the slope becomes a negative number, you will not be able to save the data. The Slope/ Intercept values on the graph will be displayed in red. You must de-select a Scaling Recorder session that caused the slope to be negative.*

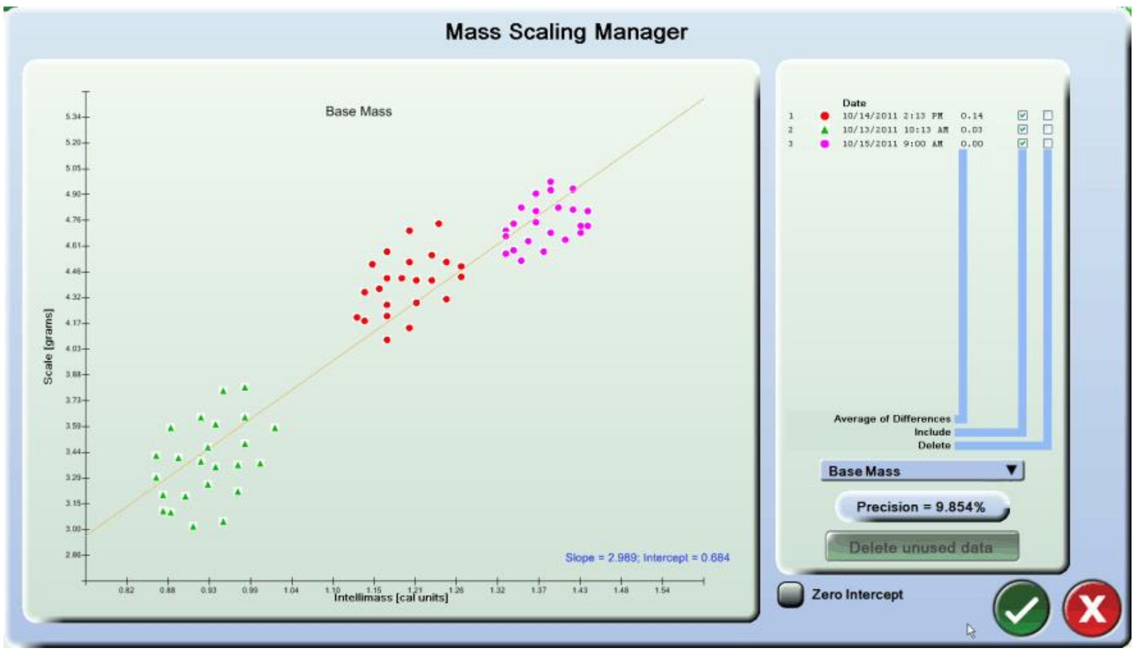
---

*How to pick the appropriate Scaling Recorder sessions

The objective is to pick Scaling Recorder sessions that provide the lowest **Precision Error** value. Optimal values are between 0% and 10%. Look at the Precision Error values as you check or un-check each Scaling Recorder session. If the Precision Error value goes above 10% when you select a Scaling Recorder session, then you may want to un-check and/or delete that session.

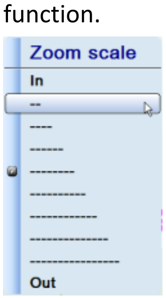
Example of a good collection of data

The graph below shows three sets of bottle sections; one set of light bottle sections (green triangle), one set of normal bottle sections (red circles), and one set of heavy bottle sections (magenta circles). These sets supply enough data to properly scale the system for the current part program.



Using the Zoom function

To see all of the data points on the screen, or to look closer at a set of data, you can use the Zoom function.



➢ ***To zoom in or out:***

1. Right-click over the graph. The Zoom pop-up menu is displayed.

2. Choose one of the zoom in or zoom out options by clicking one of the lines in the menu. To keep the same zoom level, click the checked line. The menu closes.

Recommended Practices When Scaling and Using the Intellispec Mass System

The following are recommendations that should be practiced when scaling and measuring with the Intellispec mass system in order to ensure the most accurate results possible. These recommendations, if followed, will keep the number of outside variables to a minimum and will give correct scaling values.

Recommended practices for using the Imass during scaling

We recommend the following when using the Scaling Recorder:

a) Clean the emitter covering before scaling [***Maintaining Emitters*** (on page 50)]. Make sure they are free from oil and debris. If the emitter were covered with oil and other debris when the sensor is set up, subsequent cleaning could cause the sensor to be saturated between bottles and invalidate the readings.

b) Make sure the gripper fingers are maintained so that bottles are consistently positioned in the field of view of the sensor. The gripper fingers must have sufficient and consistent pressure such that bottle sway and tilt are minimized.

c) Make sure lighting is adjusted to the correct levels to ensure proper sensor readings for both base and sidewall emitters/sensors. These levels should be adjusted with no bottles in front the sensors. [***Adjust Lighting*** (on page 27)]

Recommended practices for cutting and weighing bottles during scaling

We recommend the following for cutting and weighing bottles during scaling:

a) The hot wire cutter should be in good condition. The bottle should be fixed such that it is stable during the cutting operation.

b) The appropriate section dimensions should be provided and used in order to set up the wires of the wire cutter at accurate positions to cut each bottle section. Once set, use the same wire positions for all bottles and do not change. If changed, inaccurate mass readings between bottles could result.

c) Make sure the red holders for the bottles are positioned correctly for the specific shape of the bottle. The bottle should be level and fit nicely without stretching out the far holders on either side. (The reason for this is to ensure accurate section measurements of the bottle. For each section length measured, the wires are positioned starting from the far left holder. If the bottle stretches these end holders when placed in them, the section lengths will be incorrect, even if the wires were placed at correct lengths before placing the bottle.)

d) When cutting the bottle, lower the wires smoothly and quickly. Lowering the wires too slowly results in warping of the bottle sections and lowering too quickly results in pressure being put on the bottle, causing inaccurate sections.

e) The scale has a resolution of .01 grams and is zeroed between readings. It should be properly shielded from air currents. Uncontrolled drafts in a factory can cause a scale reading to vary substantially. Do not stand directly in front of the scale where breathing could disrupt the measurement of the section

f) The bottles used for scaling the sensor must read, in grams, no more than 10% outside the spec limits of the bottle. A proper scaling requires some bottle sections that are a little heavy and a little light but not outside the specs. Sampled bottles with section weights that are out of tolerance are not used in the determination of scaling parameters.

g) The scaling operation (in the Mass Scaling Manager) should yield a Precision Error value of 0% to 10%.

h) The system accuracy checks should use 20 or more consecutive bottles from the same cavity.

Chapter 6

Inspections for Intellimass

There are two inspections you will use with an Intellispec mass sensor: Empty Pocket and ***Mass inspection*** (on page 43).

Setting up an Empty Pocket inspection is the same as when used with camera sensors. It is mandatory if your system is using a PDX for part tracking.

Mass Inspection

Add a Mass inspection for mass sensors after an Empty Pocket* inspection. Mass inspection sets the limits for the mass measurement made by the sensor.

*An Empty Pocket inspection is required if your system uses a PDX for part tracking. If your system uses part detectors instead, then Empty Pocket is optional.

❖ *Note: only one Empty Pocket and one Mass inspection are permitted for each mass sensor part program. If you have already added either of these to the part program, then they are not available to add from the Inspection menu (even if one is disabled).*

➢ ***To add a Mass inspection:***

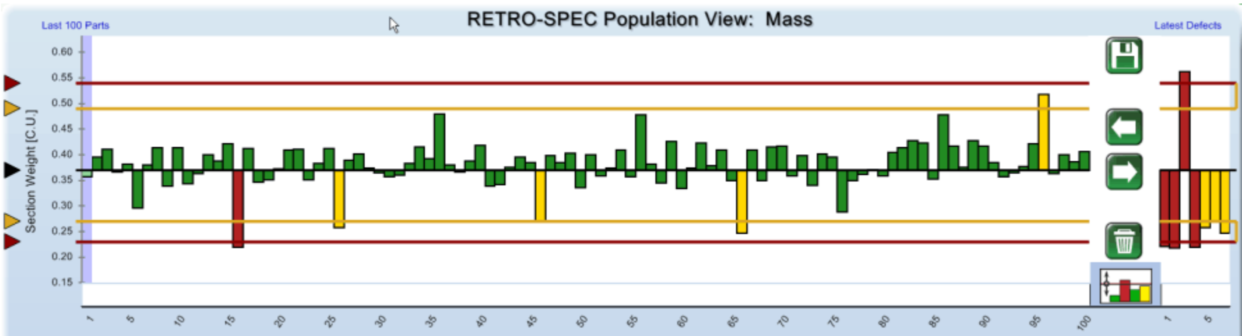
1. If this is the first part program you are setting up for the sensor, make sure you have previously set up lighting and acquisition timing for the sensor. See the sequence of steps in ***Setting up a Mass Sensor*** (see "***Sequence for Setting up a Mass Sensor***" on page 33).
2. If your system uses a PDX for part tracking, make sure there is an Empty Pocket inspection added for the current part program.
3. Right-click in the inspection tree to see the Inspection menu.
4. From the Inspection menu, select Add > Mass Inspection. Re-name it to something more meaningful to you, if desired. The inspection is added to the inspection tree.
5. The Mass menu is displayed below the Retro-Spec graph. (The menu is described below) Adjust the parameters as necessary.

Mass menu

➢ ***To set Mass Limits:***

1. Make sure there are some part readings in Set A (the left side of the Retro-Spec graph).
   - If there are no part readings, put the lane online long enough to allow several parts to pass by the mass sensor. When enough parts have passed, double-click the Mass inspection name to edit the inspection. Editing can be done while the lane is online, but will take longer than if the lane is offline.
2. Right-click over the Retro-Spec graph to see the Retro-Spec Options menu. Choose Auto Select Limits from the menu. The system sets the limits based on the current population (Set A).

3. Adjust the automatically set limits if desired by moving the bars on the Retro-Spec graph, or by setting the limits through the Mass menu. An example graph is shown below.



For more information about using the Retro-Spec graph and editing inspections, see the section titled Inspection Overview.

Chapter 7

Running Intellimass

Operator Maintenance Frequency

If you are scaling the system, sample bottles' section weights should be input regularly. This will ensure accurate long-term results of the sensors.

Perform the procedures as listed in the table below, or as necessary based on plant conditions.

Procedure	Description	What this requires	Frequency
Update the system using Scaling Recorder ***How to use the Scaling Recorder*** (on page 35)	Cut and weigh bottles and input data into Intellimass	▪ Intellimass downtime - few minutes ▪ Running blow molder ▪ Permission to Run Mass Recorder*	*If running a new bottle*, **three times per week**, or **Once per week** to maintain accuracy
Scale the system using Mass Scaling Manager ***How to use the Mass Scaling Manager*** (on page 38)	Scale relationship of cut and weighed bottles to Intellimass readings	▪ Intellimass downtime - few minutes ▪ Blow molder does not have to be running ▪ Permission to Run Mass Manager*	▪ Check after each Scaling Recorder session
Verify part tracking ***Mass Part Present Delay Calibration*** (on page 15)	Calibrate part-to-sensor alignment	▪ Intellimass downtime - few minutes ▪ Running blow molder ▪ Permission to run part present delay calibration*	**Weekly** (Or anytime someone has been in blow molder and may have bumped sensors, including part detect)
Maintain Hardware ***Maintaining the Hardware*** (on page 49)	Clean emitters and sensors	▪ Canned, compressed air ▪ Lens cleaning tissue ▪ Clean, non-abrasive cloth	**Daily and Monthly**

*For information about permissions, see Manage Permissions

How to change parts (Part changeover)

If changing to parts of the same size

If the new part will be similar in size and shape as the current part, you do not need to move the sensors or emitters.

If the system already has a part program for the new part, load the part program. See ***Load a part program*** (on page 46)

Reset the statistics, if desired, by right-clicking the statistics menu next to the traffic light signal and clicking Clear Lane Statistics from the menu.

If changing to parts of a different size

If inspecting a different size or type of bottle, you may need to move the sensors and/ or emitters. The base sensor and emitter should never be moved. The shoulder (upper) sensor/ emitter pair are rarely moved. The lower sensor/ emitter pair may need to be moved.

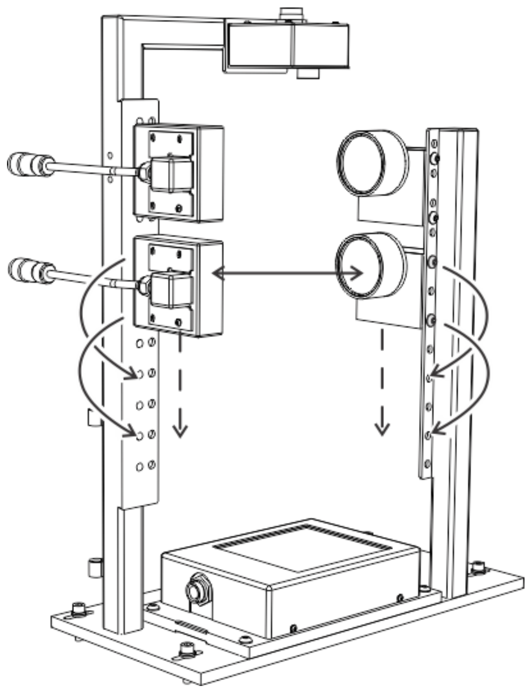
⚠ **DANGER**: STOP the blow molder before moving sensors and emitters.

➢ ***What you need:***

- A sample of the new part
- A 4mm Allen wrench
- Access to your blow molder, to move sensors and emitters

➢ ***To change parts:***

1. Load the part file for the part you will be inspecting. See ***Load a part program*** (on page 46).
2. Determine the position for the lower sensor/ emitter pair to accommodate your new part.
3. Using the 4mm Allen wrench, loosen the button head screws that hold the sensor and emitter. (move one at a time)
4. Move both the sensor and emitter to the same height (up or down) on the mast. (example shown below).
5. Tighten the button head screws for both sensor and emitter.
6. Reset the statistics (optional).
7. Put the lane online (click the green traffic light signal).
8. Run bottles through your blow molder. The Intellimass will now inspect the newly changed part.



Load a part program

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

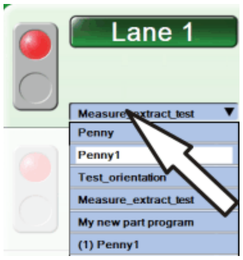
❖ *Note: Some menu items are only available to advanced level users.*

➢ ***What you need:***

- User permission to Switch Part Program

➢ ***To change parts:***

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



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

Chapter 8

Maintaining the Hardware

Hardware maintenance checklist

Proper maintenance is crucial to consistent measurement results and system longevity. Clean or replace the items in the table monthly, or as specified by your Quality Assurance department.

❖ *Note: The Intellimass system has an* ***alarm*** *that notifies you when the sensors and emitters need to be cleaned. For a description and alarm settings see* **Maintenance alarm for lighting levels** *(on page 28).*

Item	Description	Module	Frequency
Emitter diffuser	Clean diffuser	Mass emitter diffuser	Daily
Sensor lenses	Blow off dust; use lens tissue with lens cleaning solution	Intellimass sensors	Daily

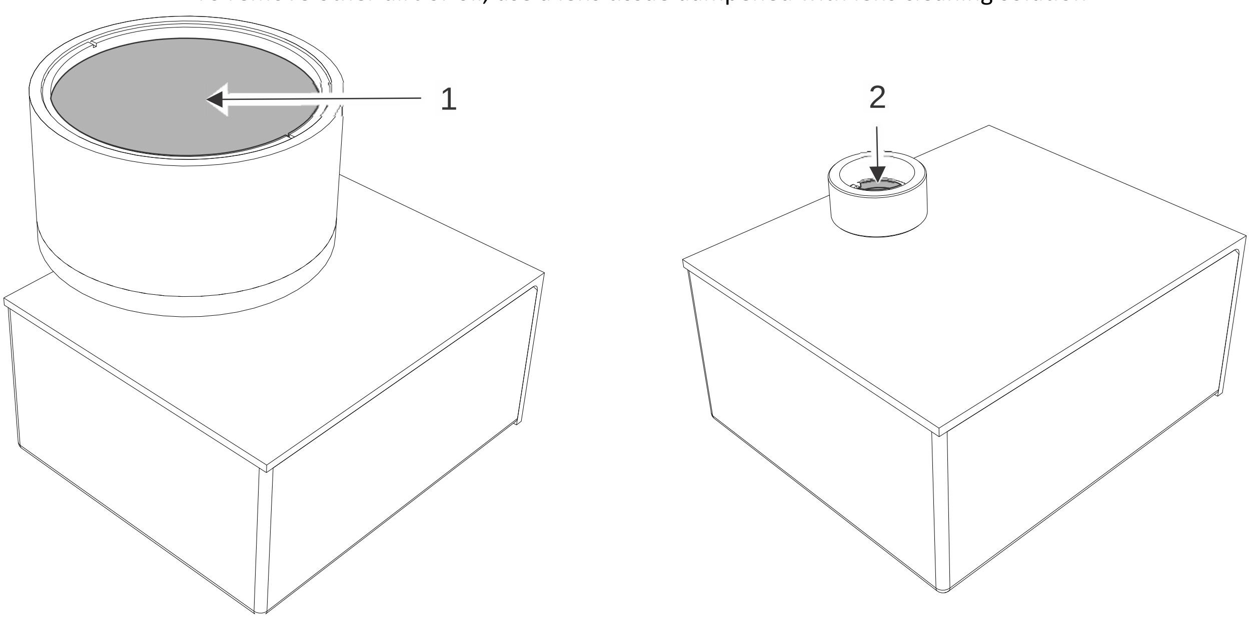
⚠ **Caution**: Make sure equipment is OFF before performing maintenance

Maintaining Sensors

Make sure the sensor lenses are clean and free of dirt and debris. Cleaning frequency will depend on plant and process conditions.

➢ ***To clean sensors:***

- Blow off dust with canned, compressed air
- To remove other dirt or oil, use a lens tissue dampened with lens cleaning solution



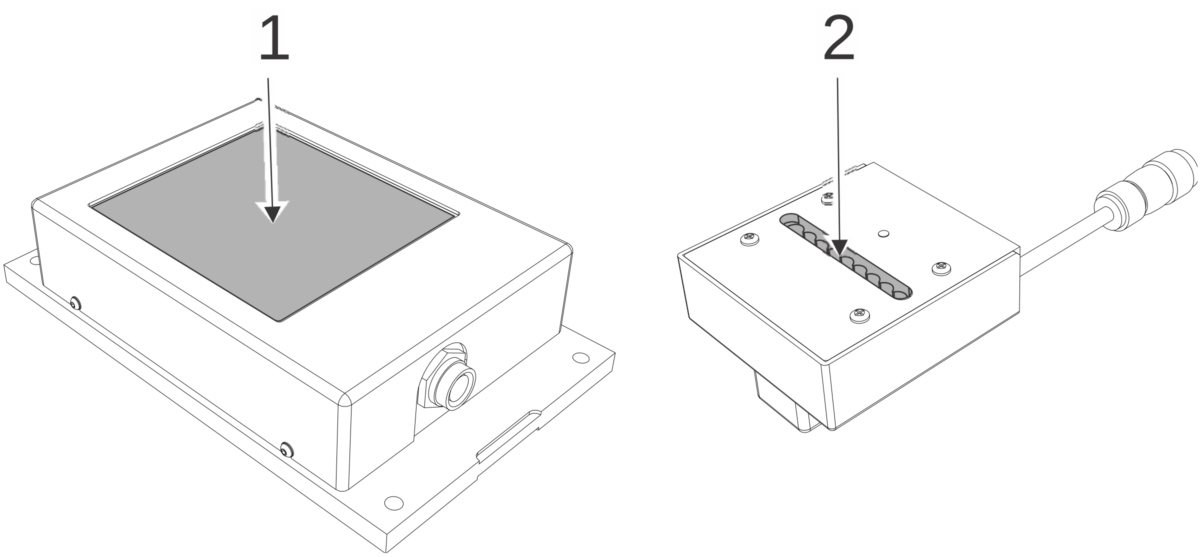
1	Wall sensor lens
2	Base sensor lens

Maintaining emitters

The emitter lenses must be cleaned periodically to ensure consistent measurement results.

➢ ***To clean lens surfaces:***

- Use canned, compressed air to blow away dust.
- Use a clean, non-abrasive cloth or cotton tipped swab dampened with mild lens cleaning solution.



1	Base emitter lens
2	Wall emitter lens

Chapter 9

Intellimass Sensor Validation (option)

Pressco offers an optional sensor validation kit (part number 76441) to test how well the mass sensors are working.

To purchase the kit, ***contact Pressco*** (on page 2). A Pressco Field Service Engineer must install the kit onto the mass sensors.

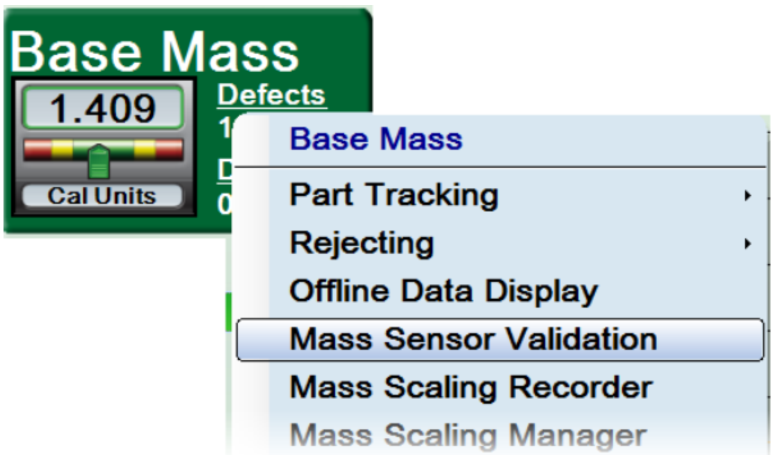
Follow the procedure that best matches your system:

- ***First Time Validation - No Baseline Exists*** (on page 51)
- ***Previous Validation Exists*** (on page 54)

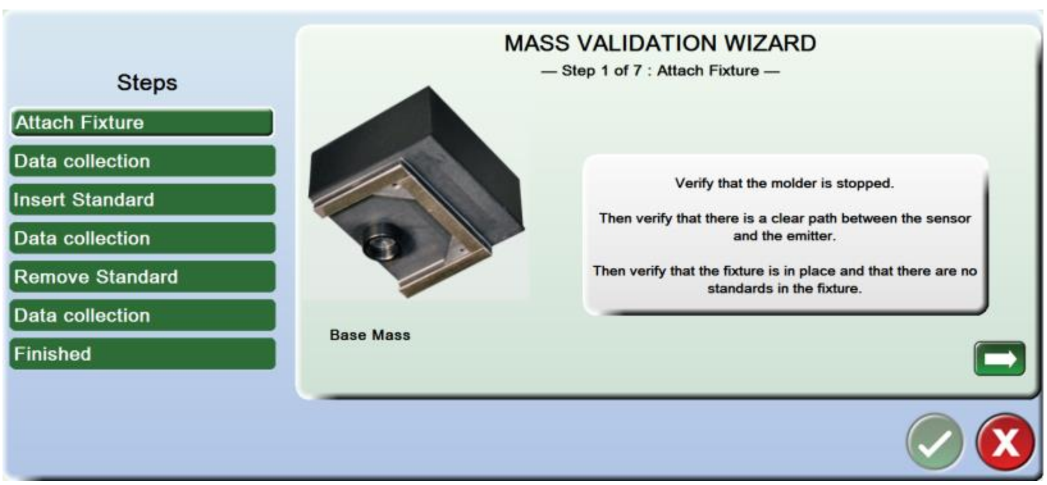
First Time Validation - No Baseline Exists

If this is the first time you are running the procedure on your system, then follow these steps.

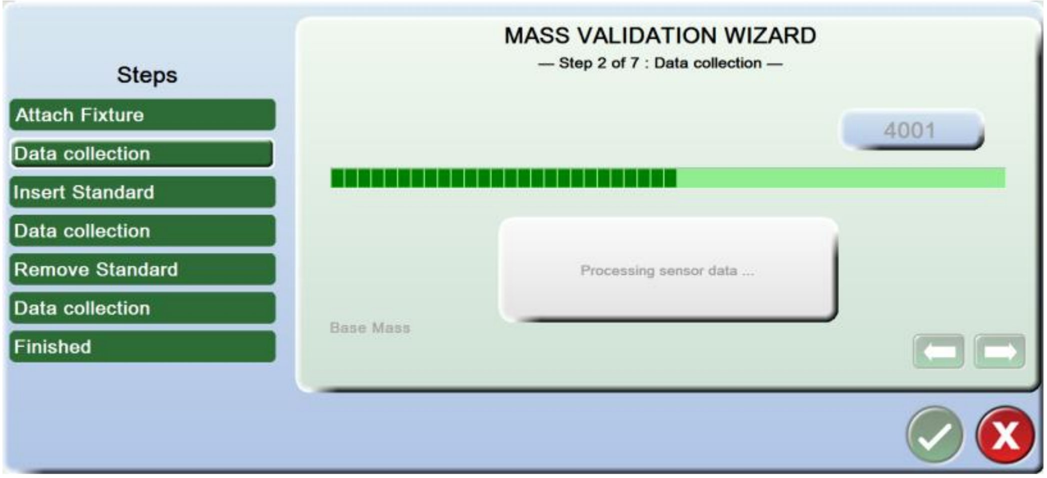
1. Make sure the lane is offline (the traffic light is red).
2. Right-click the sensor button, then select Mass Sensor Validation.



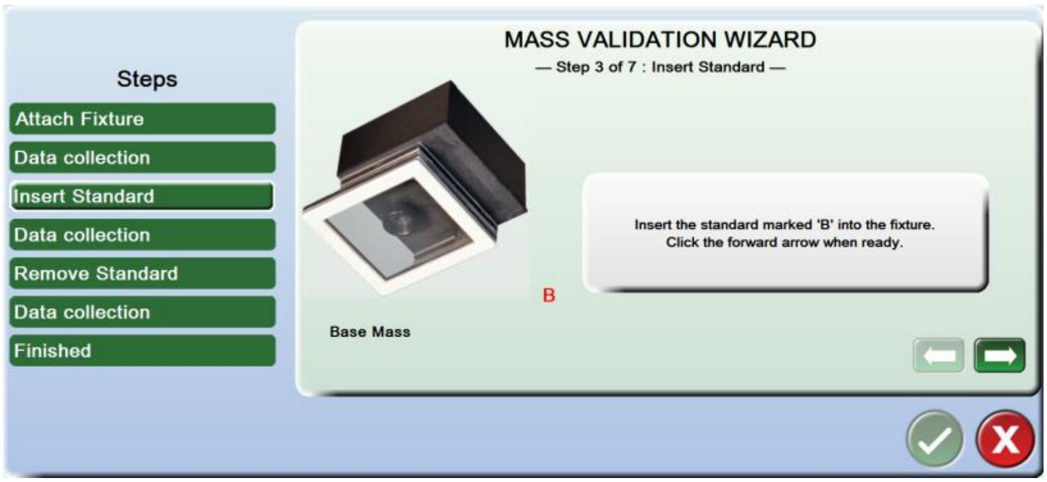
3. Follow the steps in the wizard:
4. Attach the fixture.



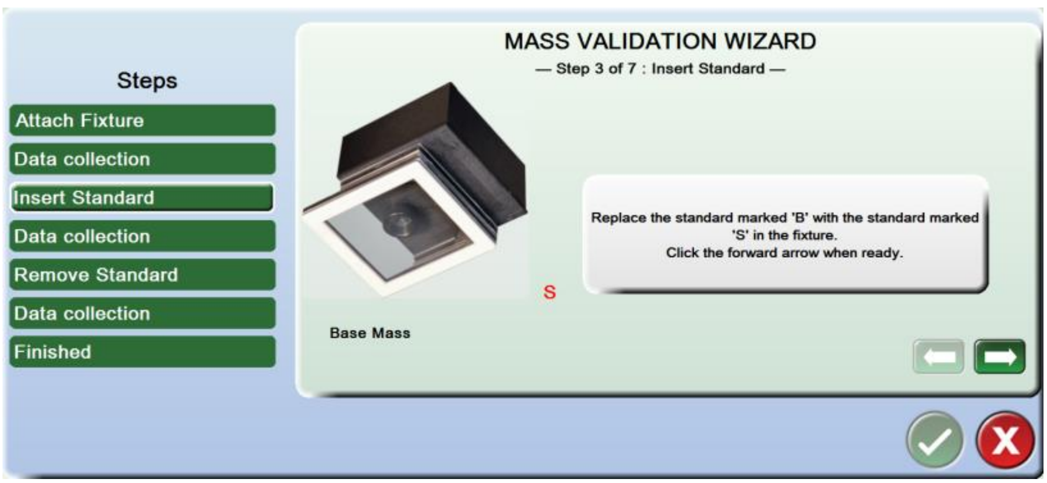
5. The system collects data.



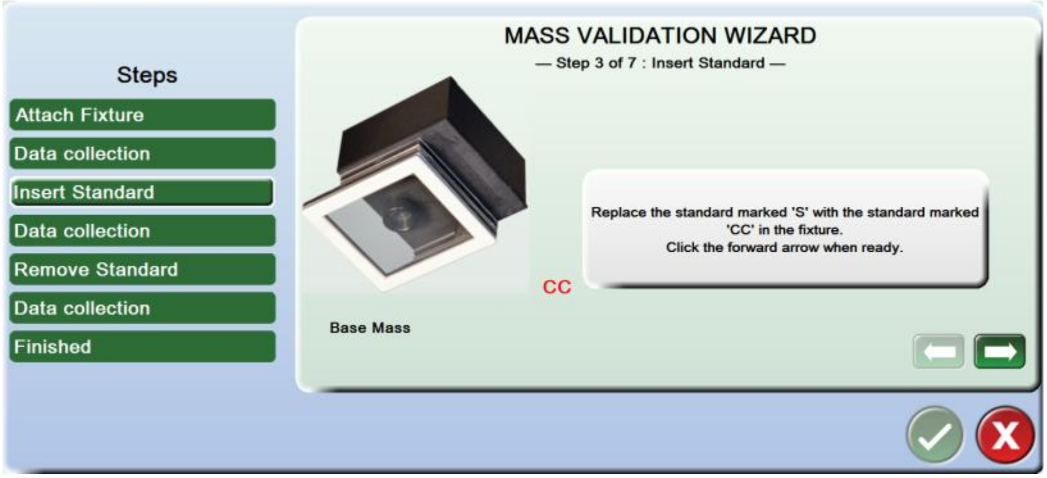
6. Insert Standard "B."



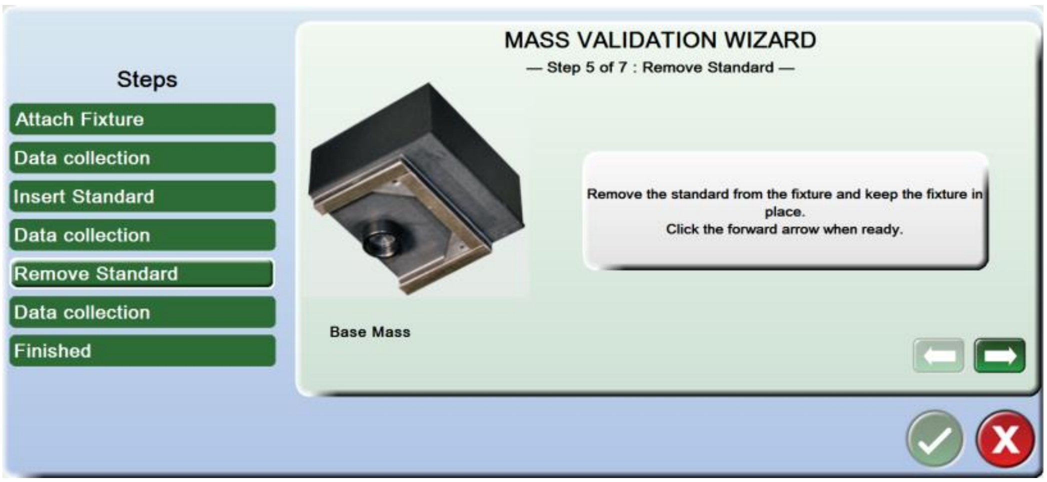
7. Insert Standard "S."



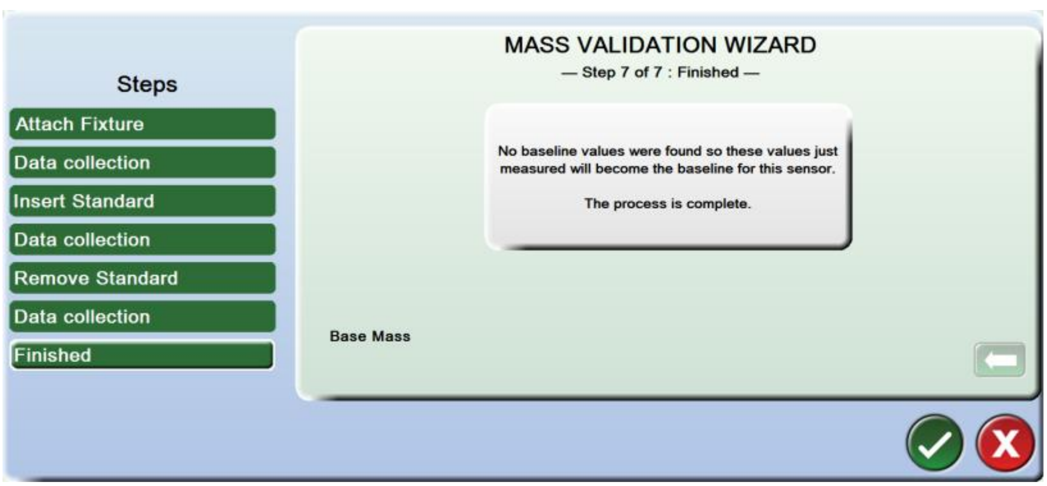
8. Insert Standard "CC."



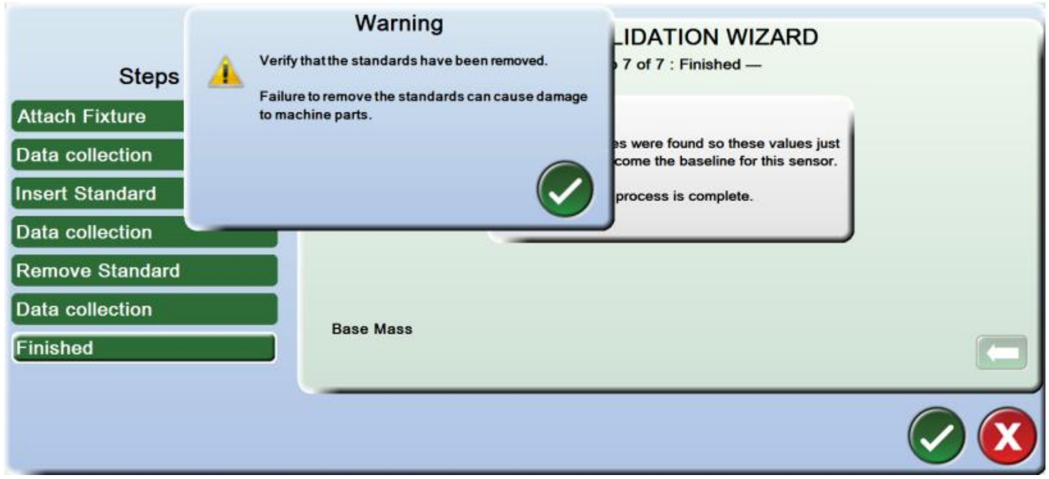
9. Remove the standard from the fixture, and keep the fixture in place. Click the forward arrow when ready.



10. The system stores the measurements as a baseline for future validation procedures. Select  to continue.



11. Make sure that the standards have been removed from the fixture, and keep the fixture in place. Select ✓ to continue.



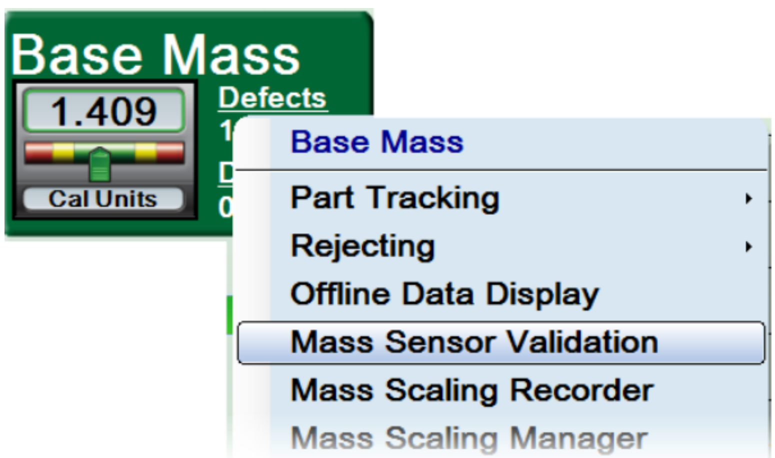
❖ ⚠ ***Warning**: failure to remove the standards can cause damage to machine parts.*

12. ✓ Select the OK button to save changes and exit.

Previous Validation Exists

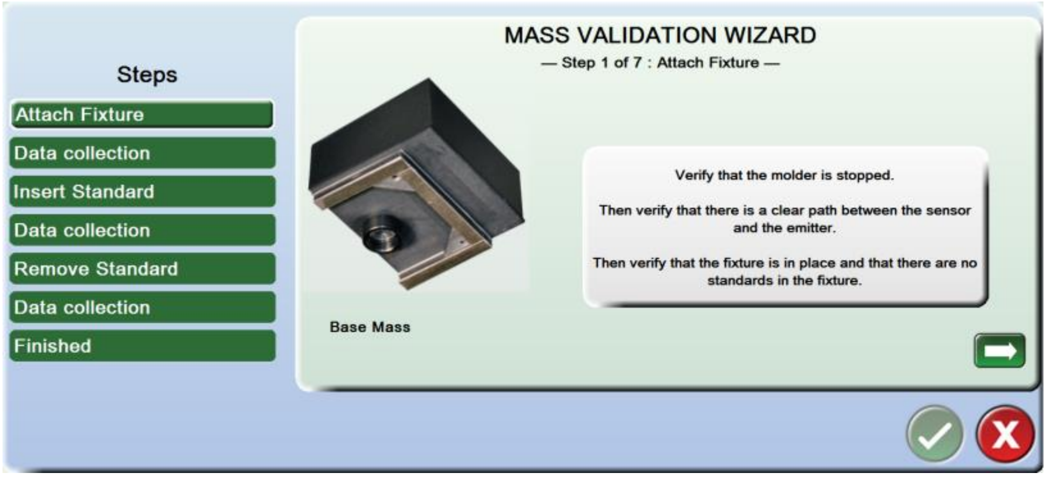
If you have run the validation procedure previously, then run the procedure as follows.

1. Make sure the lane is offline (the traffic light is red).
2. Right-click the sensor button, then select Mass Sensor Validation.

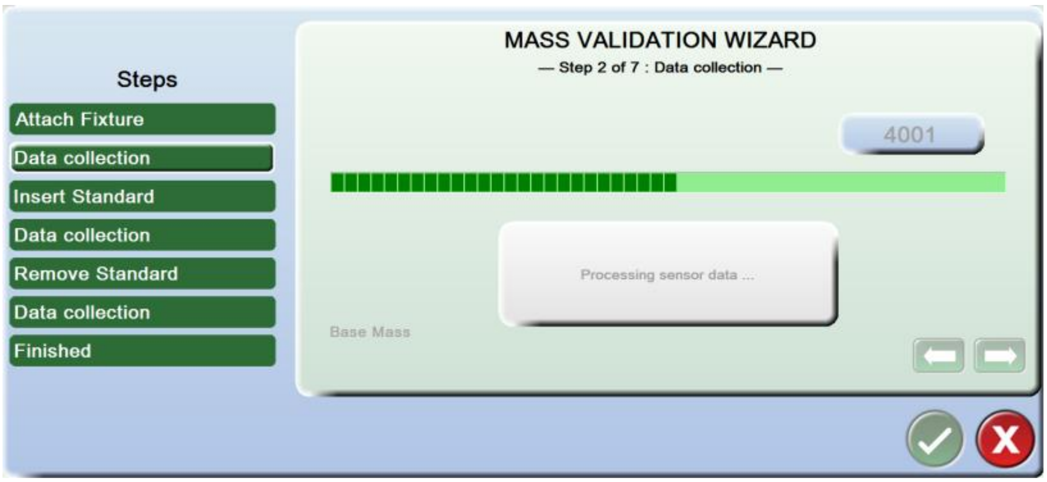


3. Follow the steps in the wizard:

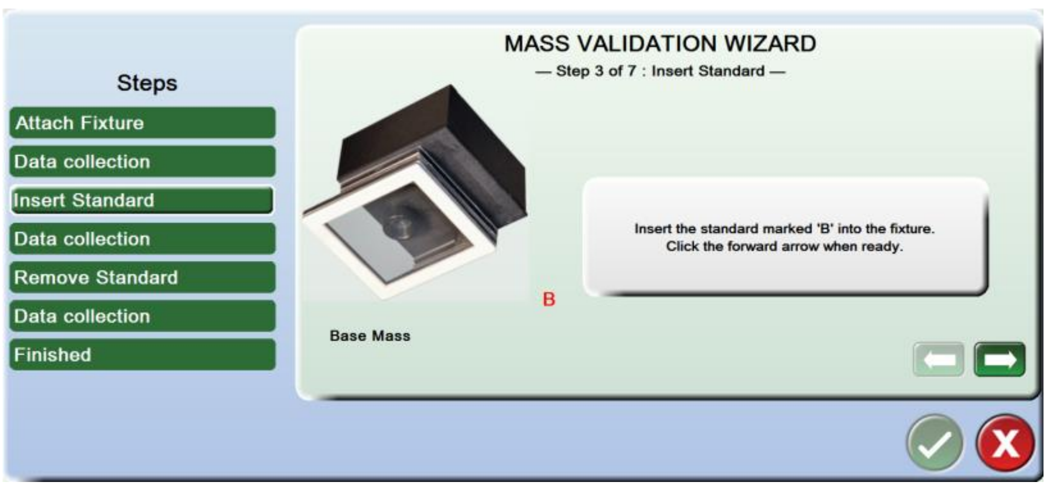
4. Attach the fixture.



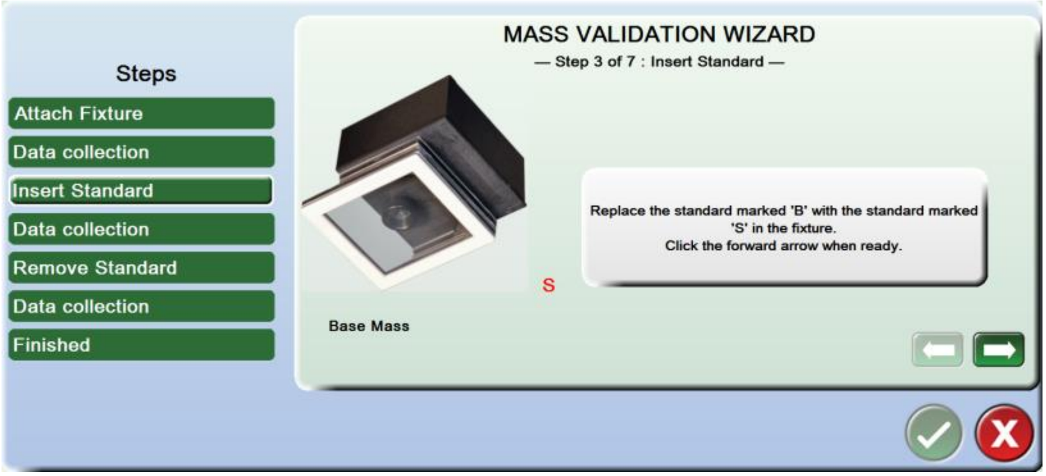
5. The system collects data.



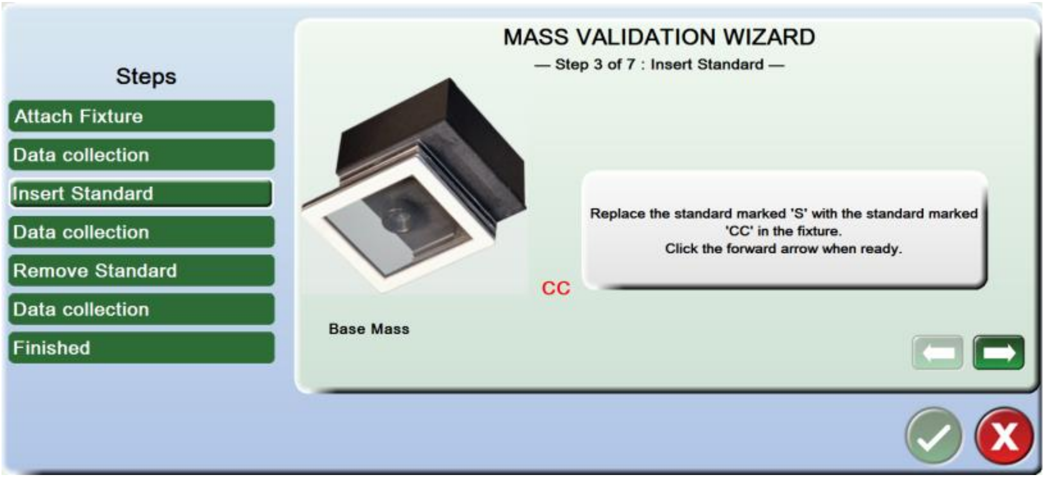
6. Insert Standard "B."



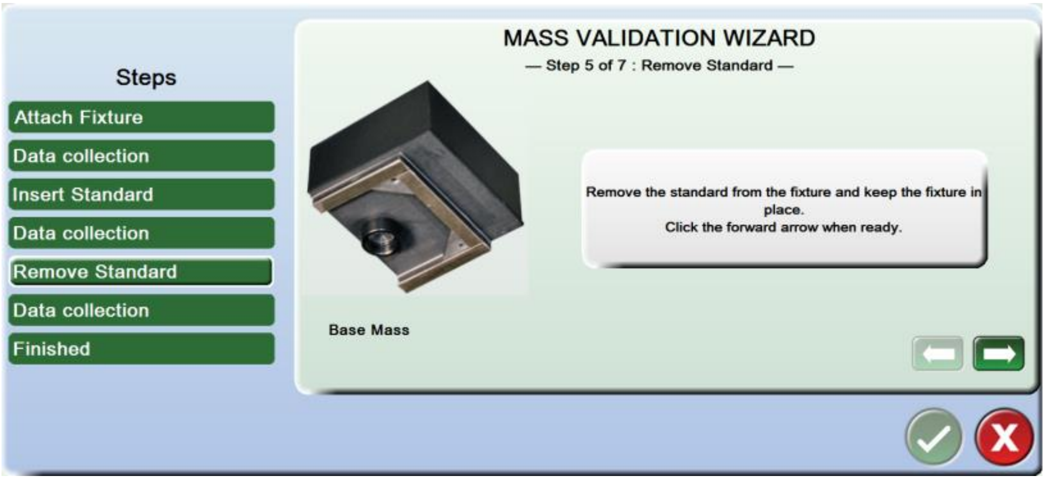
7. Insert Standard "S."



8. Insert Standard "CC."



9. Remove the standard from the fixture, and keep the fixture in place. Click the forward arrow when ready.



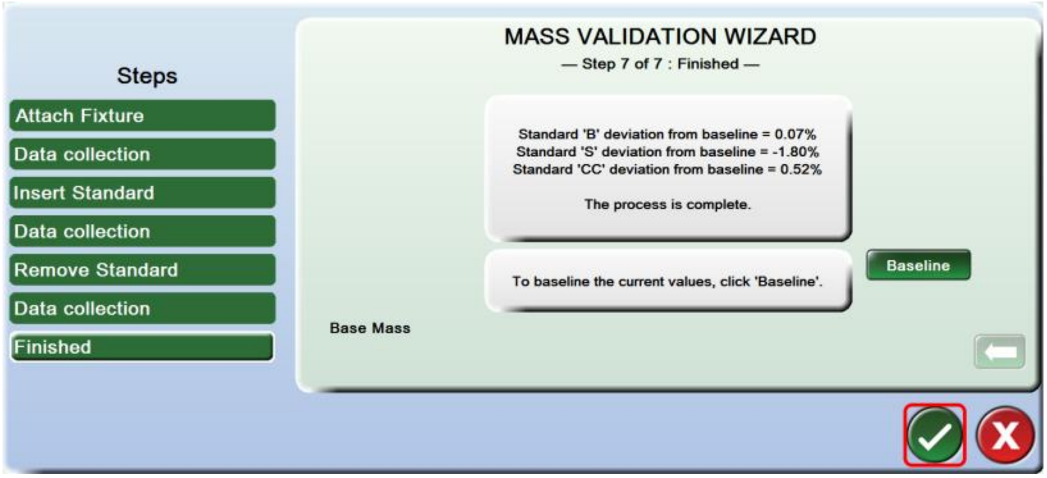
10. The system computes the difference in baseline values from previous measurements. Decide whether to keep the old values or save the new values, and complete the procedure:

- Keep the old values - ***Previous Validation Exists - Keep Previous Baseline*** (on page 57)
- Save the new values - ***Previous Validation Exists - Establish New Baseline*** (on page 57)

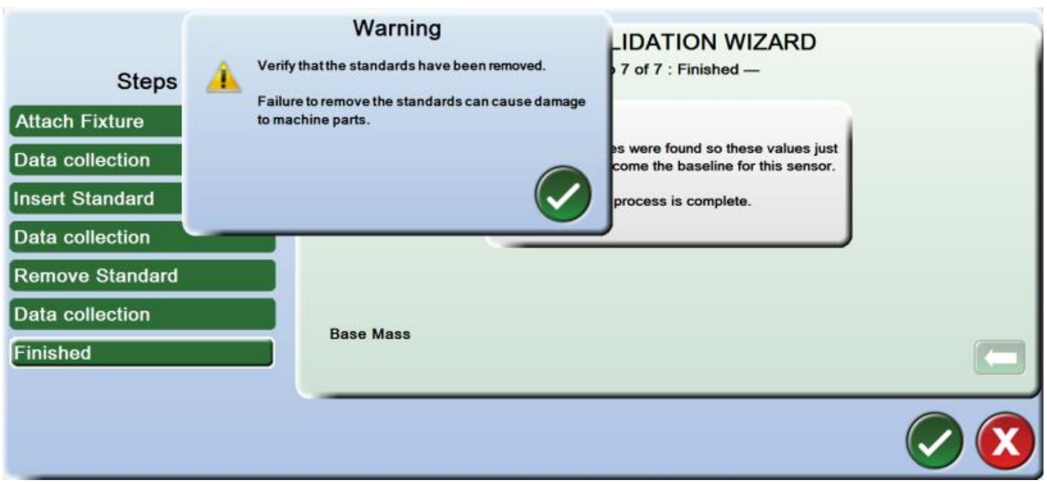
Previous Validation Exists - Keep Previous Baseline

This topic is a continuation of the ***validation procedure*** (see "***Previous Validation Exists***" on page 54), when you choose to keep the old values.

1. The system computes the difference in baseline values from previous measurements. To keep the OLD values, select to finish.



2. Make sure that the standards have been removed from the fixture, and keep the fixture in place. Select to continue.



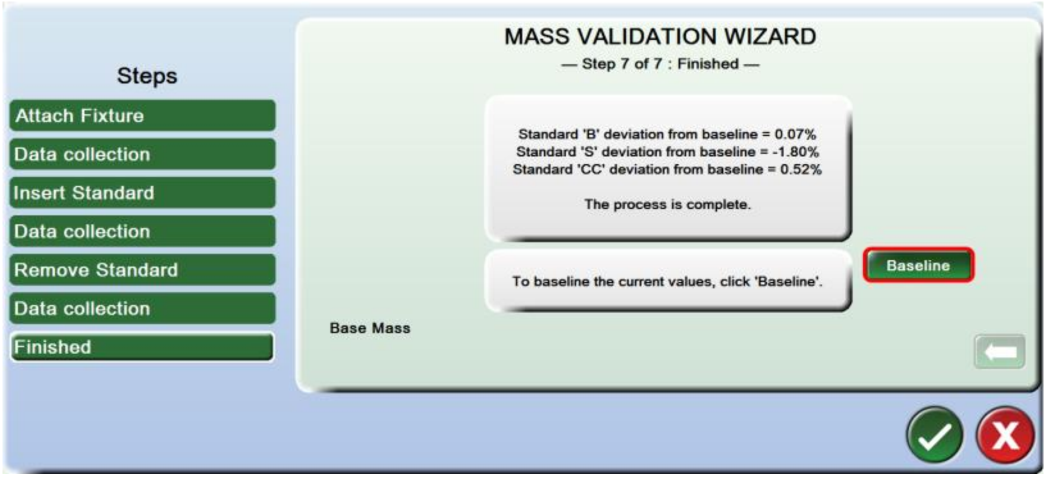
❖ ***Warning**: failure to remove the standards can cause damage to machine parts.*

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

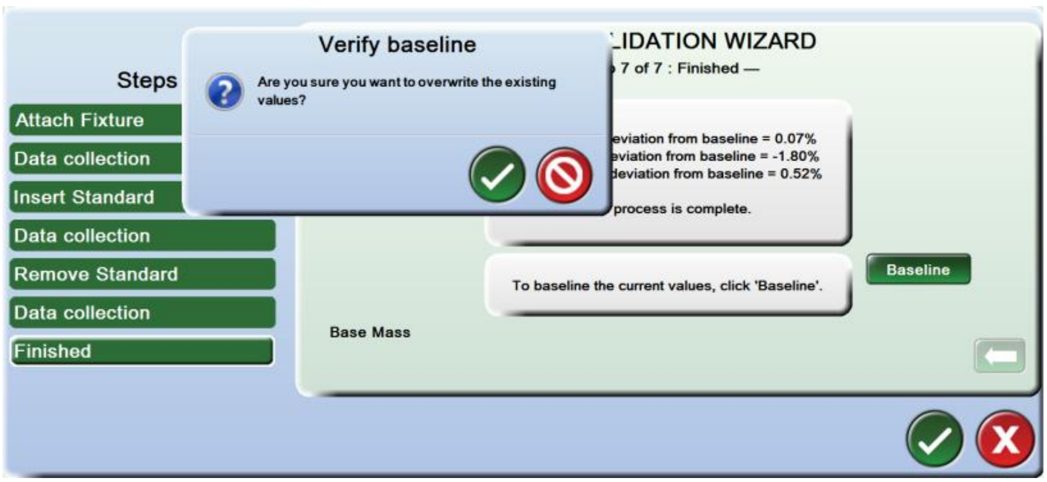
Previous Validation Exists - Establish New Baseline

This topic is a continuation of the ***validation procedure*** (see "***Previous Validation Exists***" on page 54), when you choose to save the NEW values.

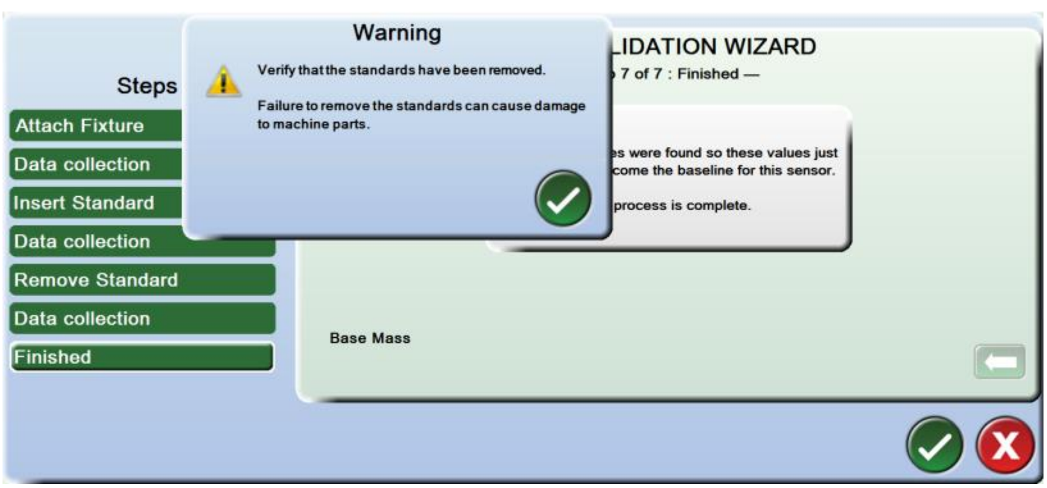
1. The system computes the difference in baseline values from previous measurements. To save the NEW values, select the **Baseline** button.



2. The system will ask if you want to overwrite the existing values. Select ✓ to save, and then ✓ again after the values have been saved.



3. Make sure that the standards have been removed from the fixture, and keep the fixture in place. Select ✓ to continue.



❖ ⚠ ***Warning**: failure to remove the standards can cause damage to machine parts.*

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

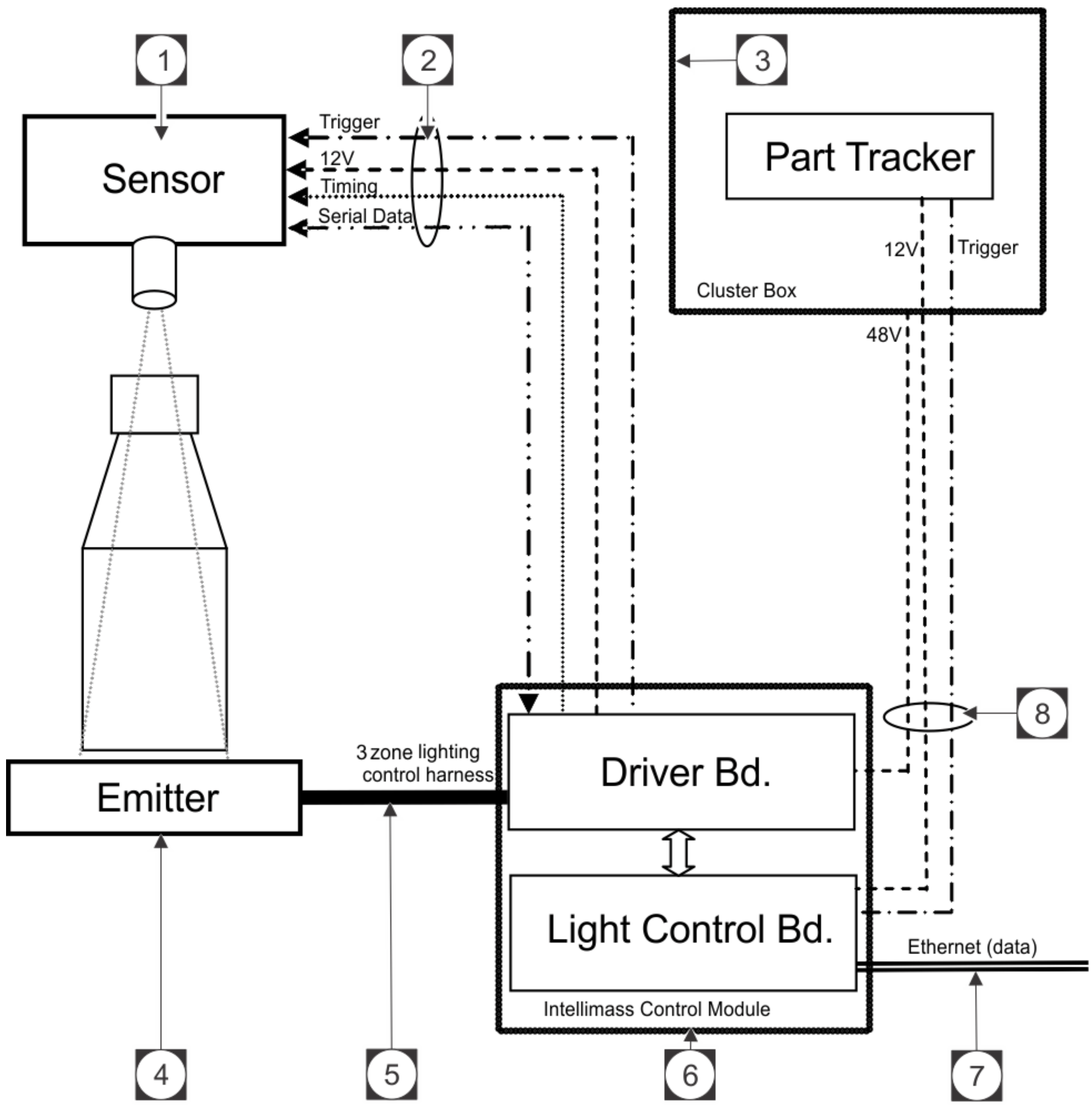
Chapter 10

Hardware Descriptions and Wiring Diagrams

Intellispec Mass System Block Diagram

The Series V Intellispec Mass is designed to be fully compatible with the rest of the Series V Intellispec system. The Intellispec Mass elements will use the power and signals available from the Cluster Box (12V, 48V, trigger, and strobe). It uses the same physical Cluster Box as used by Intellispec Base, Neck, or Seal modules in your system. The Intellispec Mass system is composed of a solid state infrared emitter, an infrared sensor, a communications/control board (same physical board as the lighting controller), and a driver board.

Below is a block diagram of a typical configuration of Intellimass. Sensors, emitters, and other modules may vary depending on application.

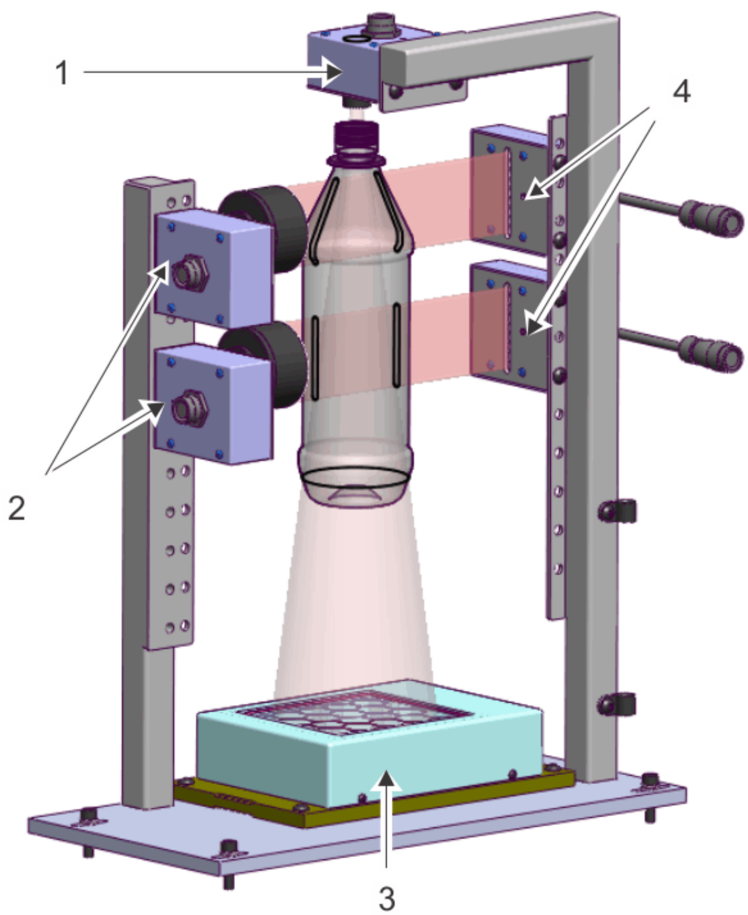


1	Sensor (base shown; block diagram also applies to wall sensor)
2	Cable from sensor to Control Box
3	Cluster box
4	Emitter (base shown; block diagram also applies to wall sensor)
5	Cable from emitter to Control Box (NOTE: this cable is different between base and wall emitters)
6	Intellimass Control Box
7	Ethernet cable
8	Cable for trigger and power from Control Box to Cluster Box

For wiring diagrams showing cable part numbers, refer to ***Base Controller Driver Wiring Diagram*** (on page 66) and ***Wall Controller Driver Wiring Diagram*** (on page 67).

Sensor and Emitter Configuration

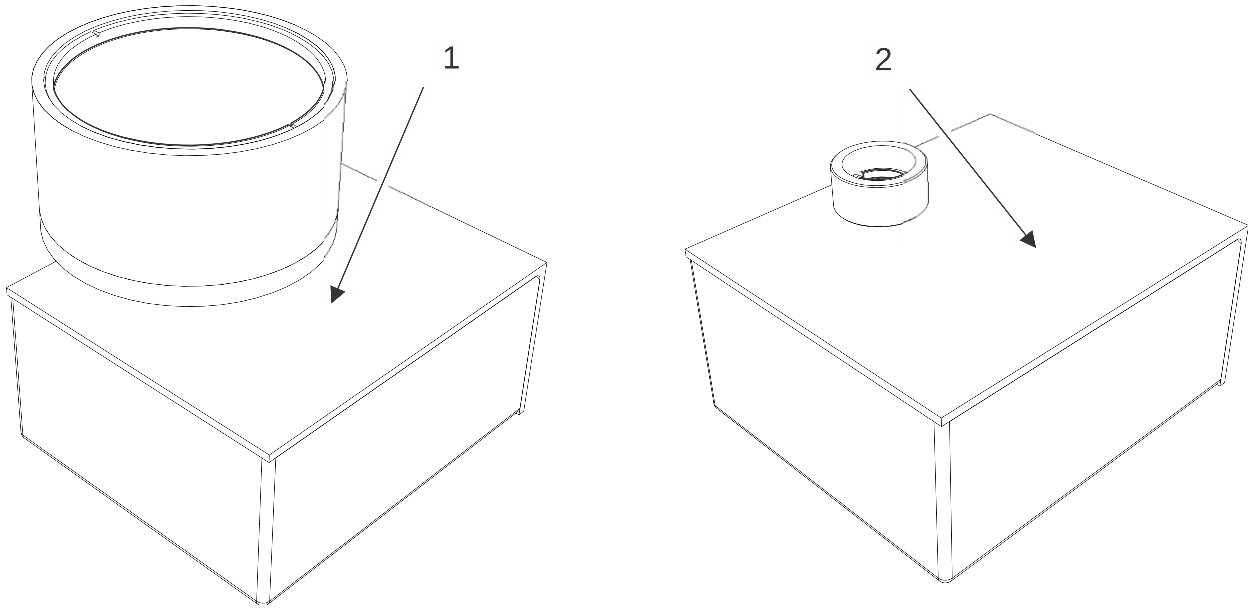
The illustration below shows a typical base and wall sensor and emitter configuration, with the infrared beams shown.



1	Base sensor
2	Wall sensor (two shown)
3	Base emitter
4	Wall emitter (two shown)

Sensors

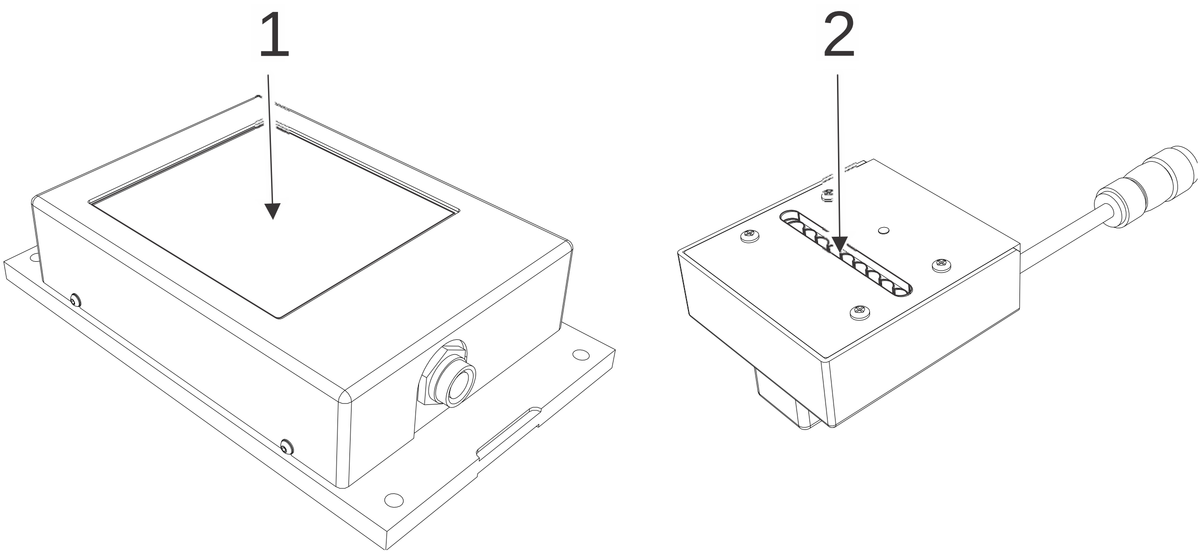
The sensors collect infrared (IR) emissions from the emitters mounted opposite them. The sensors report 31 data points for each snap point. Examples are shown below.



1	Wall sensor
2	Base sensor

Emitters

The emitters use infrared (IR) LEDs to emit IR light to the sensors. When a bottle passes between the sensor and emitter, different levels of IR data are reported. Examples are shown below.



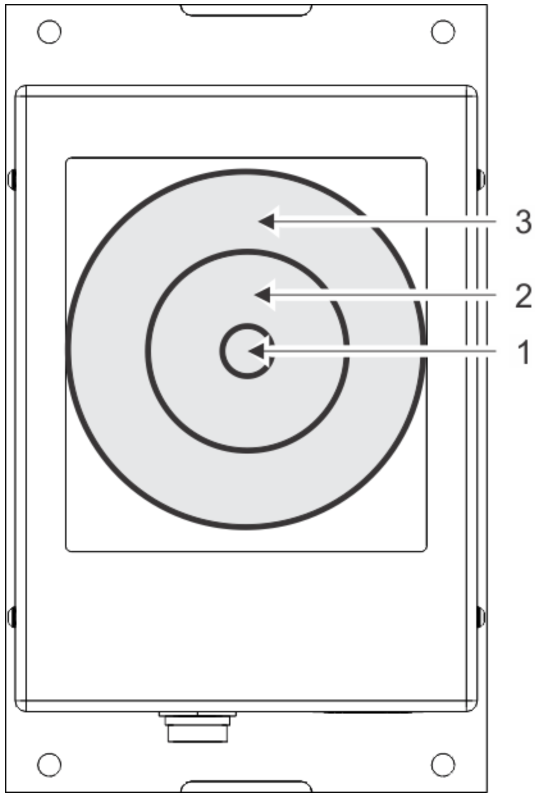
1	Base emitter
2	Wall emitter

Base Mass Emitter Lighting Zones

To help you understand how the lighting works, shown below are the zones that can be controlled in the Mass Lighting menu.

❖ *Note: in most cases, lighting is optimized through the Auto Adjust setup. Adjustment is only necessary if you have a small sized bottle, or if you want to focus the mass inspection on a specific area of the bottle.*

Below is an approximate illustration of the lighting zones in the base emitter. These zones are controlled through the lighting setup. See ***Adjust Lighting*** (on page 27)



1	Inner zone
2	Middle zone
3	Outer zone

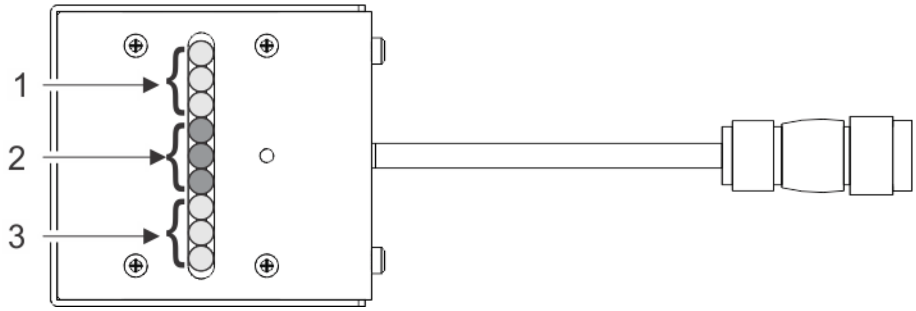
Sidewall Mass Emitter Lighting Zones

To help you understand how the lighting works, shown below are the zones that can be controlled in the Mass Lighting menu.

❖ *Note: in most cases, lighting is optimized through the Auto Adjust setup. Adjustment is only necessary if you have a small sized bottle, or if you want to focus the mass inspection on a specific area of the bottle.*

On the Sidewall Mass emitter, there are three zones consisting of three LEDs each. These are designated as Upper, Middle, and Lower zones, as you see in the Mass Lighting menu. Typically, all three zones are used. This will provide more accurate scaling of the sensor.

In some applications, you can focus the mass sensing on a particular area of the bottle. An example is if you have a short bottle that does not span the height of the LEDs. You would not want some of the LEDs to be measuring the bottle, and some LEDs emitting directly to the sensor. In this case, you could shut off the lower zone to ensure that the measurements you receive come only from the bottle itself.



1	Upper zone
2	Middle zone
3	Lower zone

Connections to the cluster box

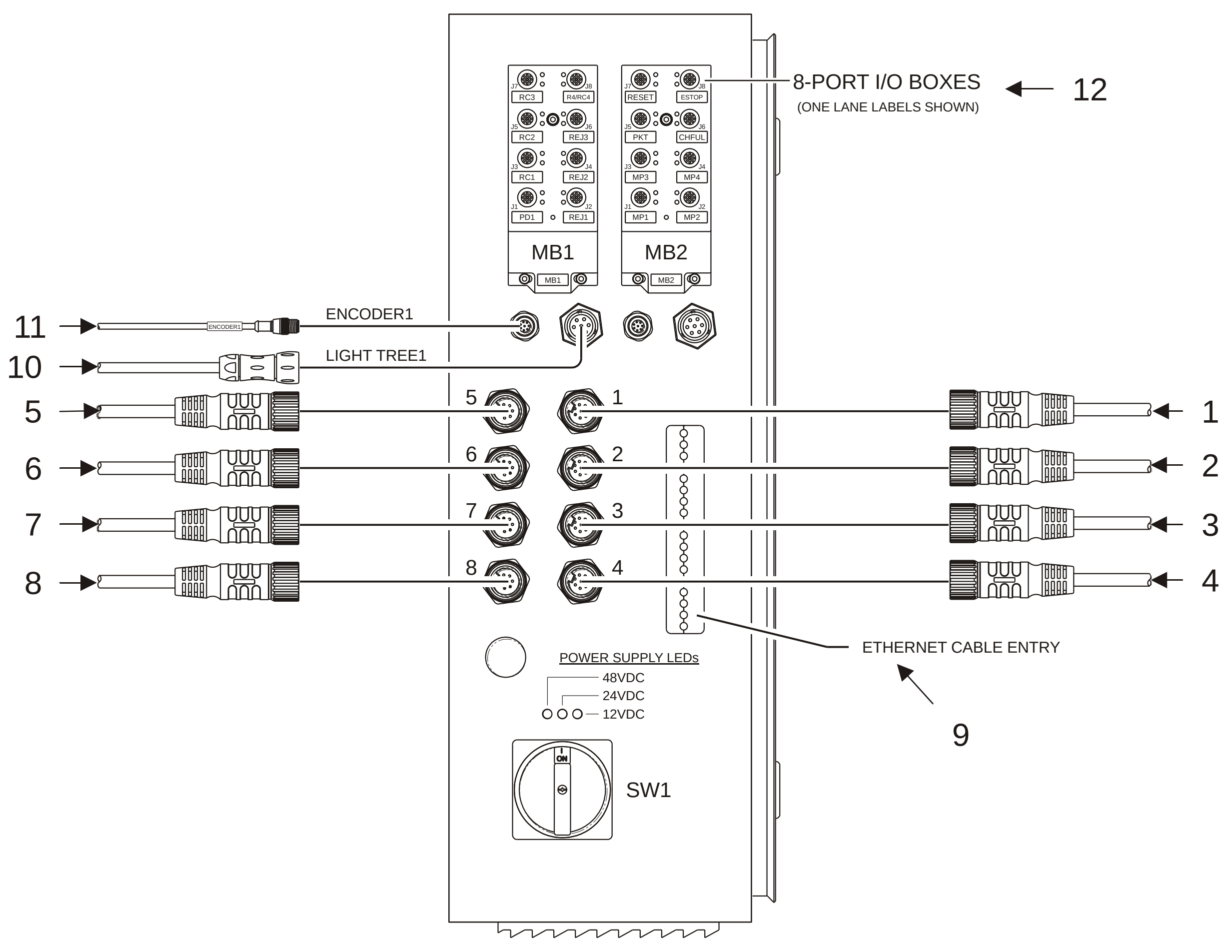
The Intellimass shares a cluster box with Base, Neck, and Seal cameras, if applicable to your system.

A basic wiring diagram is shown below. In a typical Intellimass application, cables 1-8 are connected as follows:

Trigger and Power Cable	Module
1	Preform Seal Endcap
2	Preform Wall
3	Base
4	Neck
5	Seal
6	Mass Base
7	Mass Wall
8	Mass Wall

EXTERNAL CONNECTIONS

CLUSTER BOX



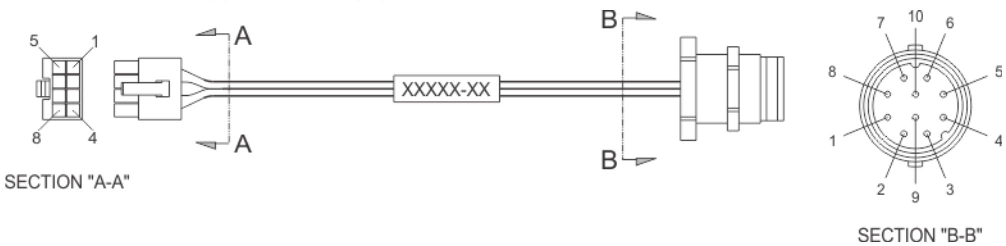
9	Ethernet cable entry
10	Light Tree 1
11	Encoder 1
12	8 port I/O boxes

Ethernet Control Network

Connect a green Cat6 (Ethernet) cable between the IMASS control box and the cluster box. The cluster box includes an Ethernet switch for the control network and provides access to the switch from outside the Cluster Box enclosure. The access port provides strain relief and a dust seal for the CAT6 (Ethernet) cables.

Trigger Signals and DC Power to the Modules

The power and signal connections are made through a ten pin Sealcon M16 connector using the pin assignments shown below. The cluster box provides eight of these connections and one connection is dedicated to each sensor. The IMASS control box will normally be connected to the next numbered sensor timing and power connector. A connector after any connected module that includes two sensors is skipped (left empty, 2W, PSE).

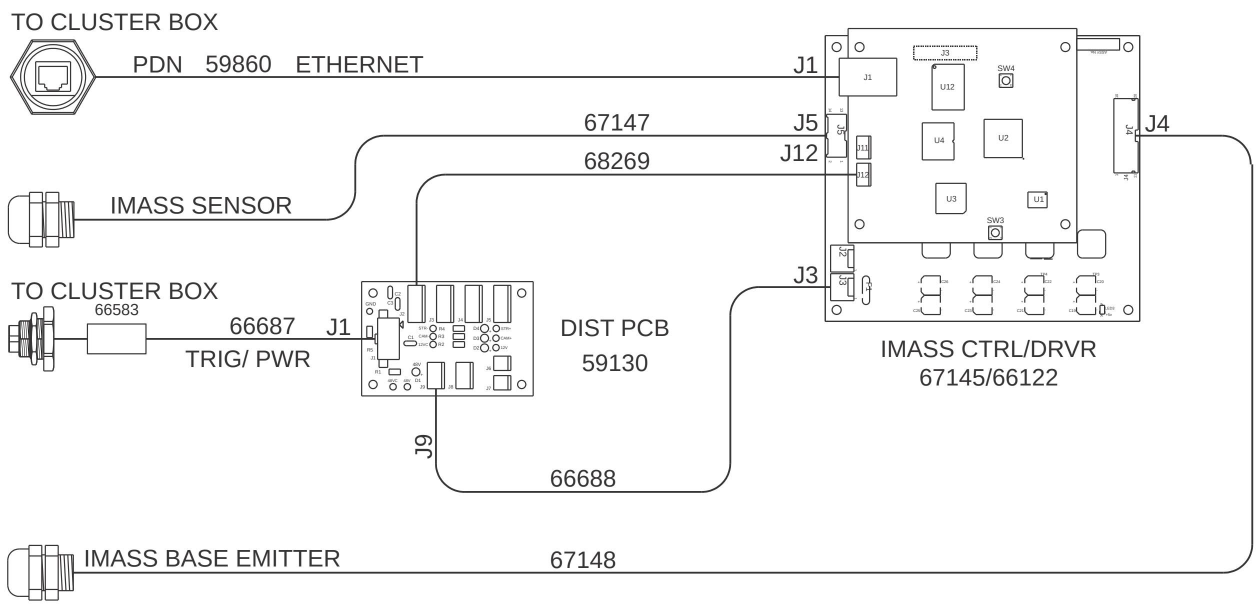


Pinouts for power and signal connections	
1	Strobe
2	Trigger
3	12V
4	48V
5	Strobe Return
6	Trigger Return
7	12V GND
8	48V GND
9	N/C
10	N/C

Base Controller Driver Wiring Diagram

Important

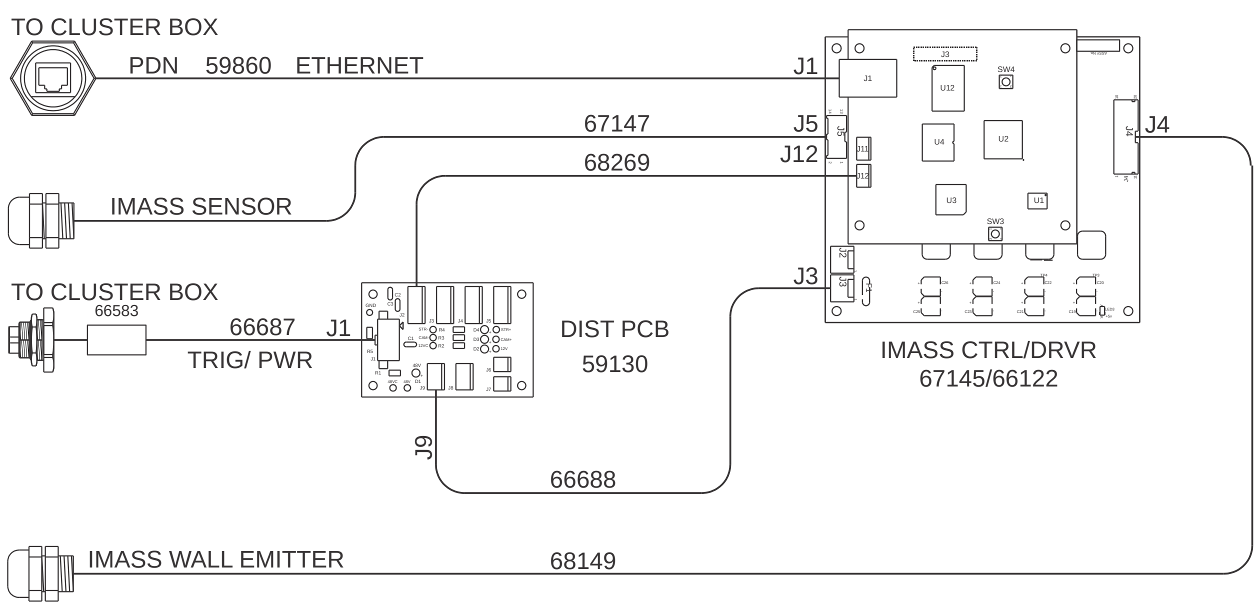
The cable from the Base Controller to the Base Emitter has 10 pins. The cable from the Wall Controller to the Wall Emitter has eight pins. Make sure the correct cable is used for the correct emitter.



Wall Controller Driver Wiring Diagram

Important

The cable from the Base Controller to the Base Emitter has 10 pins. The cable from the Wall Controller to the Wall Emitter has eight pins. Make sure the correct cable is used for the correct emitter.



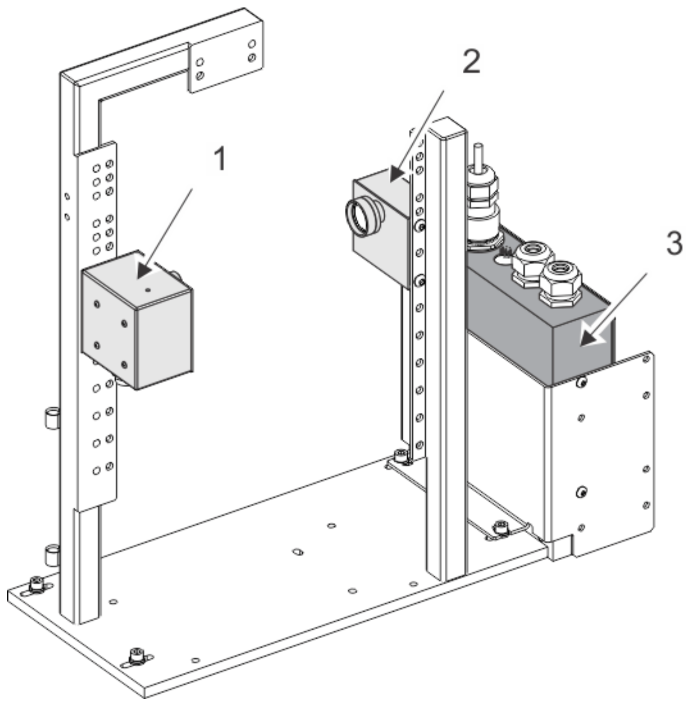
Chapter 11

Intellispec Nylon Sensor

The nylon sensor is a variation of the mass sensor. It is intended to detect the presence of nylon in the wall of a blown bottle. Lower values read by the sensors indicate more nylon detected. The setup for this sensor is similar to the mass sensor with a couple of minor differences:

- The lighting has a single control because there is just one emitter zone for nylon. The output should be set with this single control to 3800 plus or minus 200.
- The part present setup is the same as a normal mass sensor. The waveform looks slightly different from a base mass sensor.
- There is an inspection which is unique to the nylon sensor because the limits are single ended. Setup of the nylon inspection is an adjustment of a single limit. Values above the limit are failures.
- The nylon sensor can be used with the normal mass empty pocket inspection.
- The host code must be version 5.0.441 or later to work with the Nylon sensor.

An illustration of a nylon sensor and emitter is shown below.



1	Nylon emitter
2	Nylon sensor
3	Nylon control box

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