ISC CAM Virtual HMI Instruction

ISC CAM IDL C-2.0.0

July 2024

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Before start

Before start

Intended design and use of Virtual HMI

This guide outlines the procedures for commissioning, calibrating operational parameters, diagnosing faults, and transmitting basic data from the Intralox Smart Carryway IDL-C. It is intended for **automation engineers, control system developers, and others involved in relevant operations.**

The Intralox Smart Carryway IDL-C is designed for small to medium-scale applications, demonstrating our commitment to innovative and efficient solutions tailored to client needs.

Intralox is updating our products and content to reflect more inclusive language. We appreciate your understanding and patience during this transition.

How to use this document

In addition to the primary technical guide, several supplementary documents provide comprehensive information for the setup and maintenance of the Intralox Smart Carryway IDL-C:

- **Mechanical Drawing**

  Detailed schematics, including dimensions and component positioning, crucial for understanding the physical layout and assembly.
- **Functional Layout Drawing:**

  Application-specific information such as product trajectories, belt speeds, and minimum product gaps, essential for configuration.
- **ISC CAM network communication data interface**

  Describes industrial ethernet communication protocols, key for integrating with existing control systems.
- **ISC Troubleshooting Guide**

  Answers FAQs and offers tips for troubleshooting common issues, aiding in quick and efficient resolution.

These documents collectively provide a comprehensive knowledge base for effective setup, operation, and maintenance, designed to be user-friendly for both technical and non-technical personnel.

Before start

How to connect to the virtual HMI?

To establish a connection with the Intralox Smart Carryway CAM IDL-C, follow these steps:

1. **Connect Device:** Connect any device with an internet browser to the ethernet network of the ISC CAM.
2. **Direct Connection:** If not connected to any ethernet network, establish a direct connection to the ethernet port (green M8-connector) of the ISC CAM. Ensure your IP address and subnet mask are in range by configuring your device's ethernet adapter.
3. **Enter IP Address:** Enter the IP address of the ISC CAM into the navigation bar of an internet browser like Microsoft Edge or Google Chrome.
4. **Find IP Address:** If the IP address is unknown, request it from the PLC network manager or use the Intralox Service Tool available on the Intralox website (www.Intralox.com/isccam). **Default ISC CAM IP address: 192.168.1.254.**

For detail instructions please refer to the ISC CAM commissioning instruction.

These instructions are designed to be straightforward and easy to follow, **ensuring efficient and effective connection to the Intralox Smart Carryway IDL-C 2.0.0**

Before start

Good to know

The following points will help get up to speed quickly with the Intralox Smart Carryway CAM:

- **IP Address Update:**
  The IP address on the virtual Human-Machine Interface (vHMI) updates only after **a complete reboot** of the ISC-CAM, requiring a power cycle.

- **Implementing Changes:**
  Click the "Submit" button to apply changes immediately without needing to restart operations.

- **vHMI Parameters & Ethernet Network:**
  Many by vHMI-displayed parameters and values are accessible via the ethernet network, allowing seamless integration for monitoring and adjustments. More details to the network connection and data interface, please refer the ISC CAM integration instruction and ISC CAM network communication data interface.

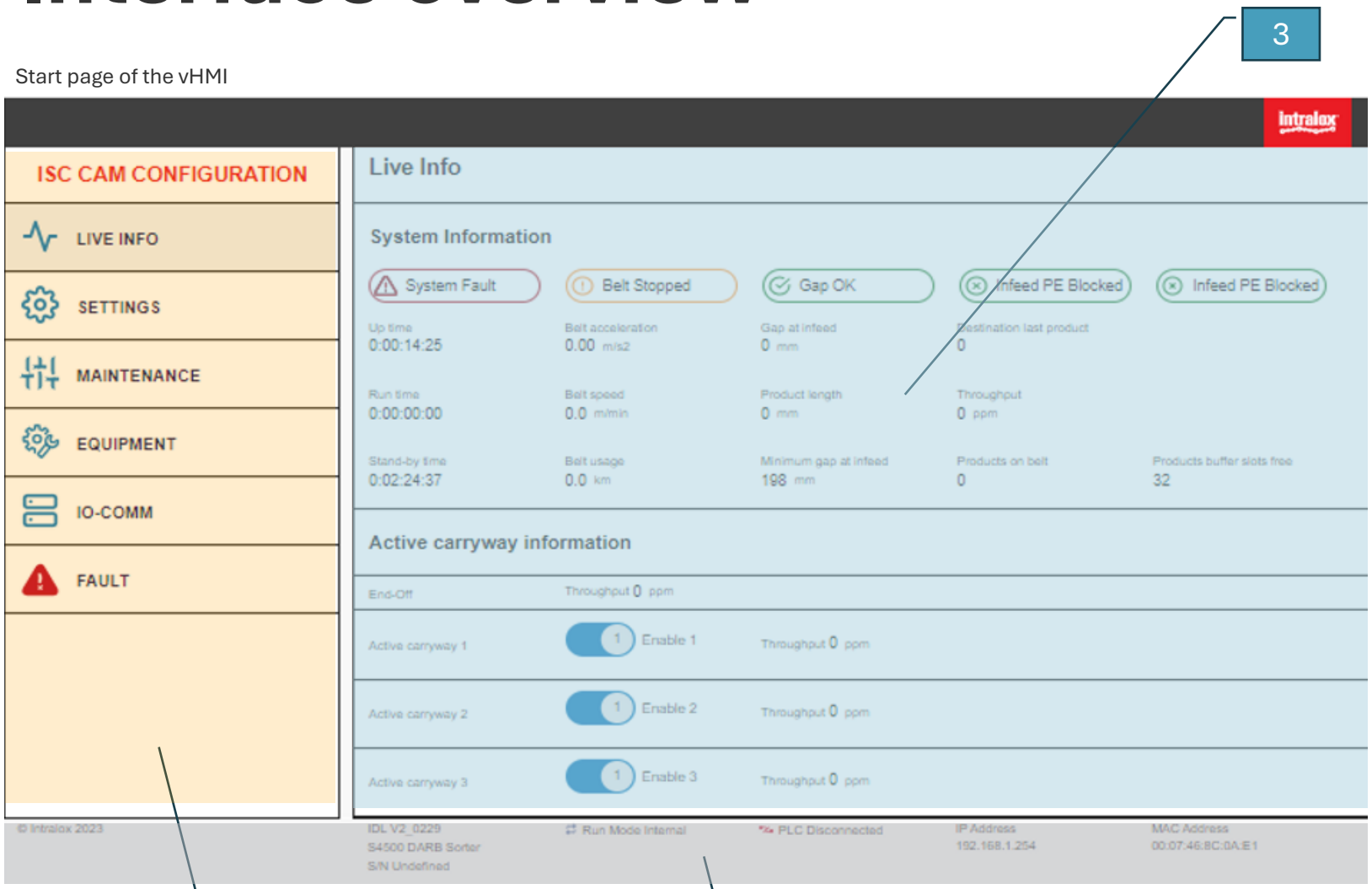
- **Measurement Units:**
  Default measurement units are set to the International System of Units (SI) for global standardization and ease of understanding.

These tips should provide a helpful guide for anyone working with the Intralox Smart Carryway IDL-C 2.0.0. For further questions or assistance, please reach out to our 24/7 technical support.

Virtual HMI Overview

Interface overview

Start page of the vHMI



Area 1: Navigation panel

Area 2: Information bar

At this area, there is followed information:

IP Address of ISC CAM

MAC Address: electronic unique identifier

IDL-C Version: Intralox Divert Logic Version

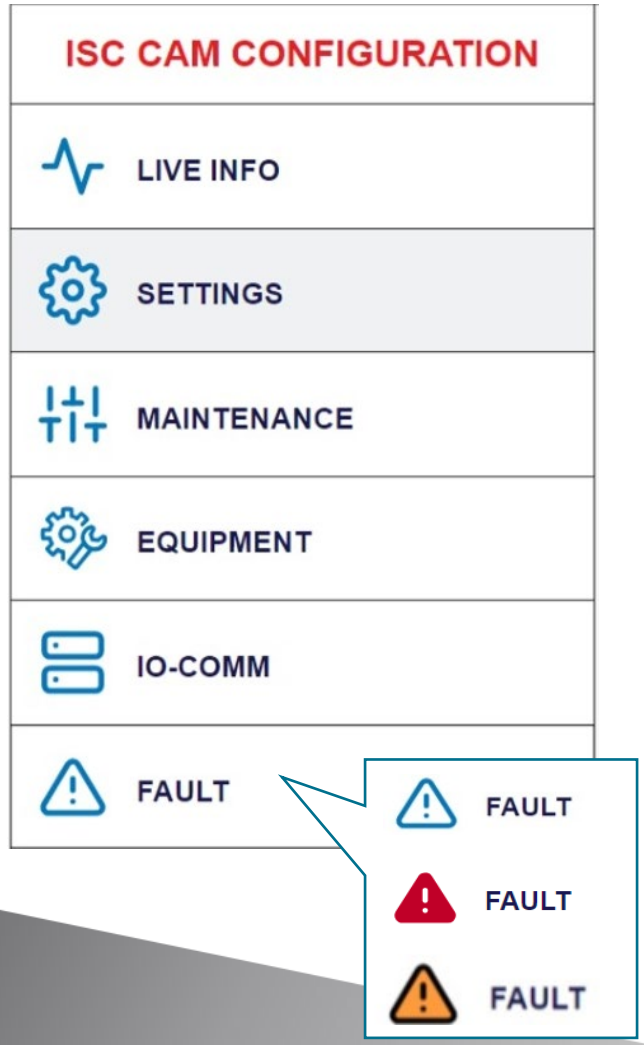
DPE Model: Intralox Product Family

S/N: serial number of the Intralox equipment

Area 3: Page unique Information

Navigation panel

Navigation panel



Under the navigation panel:

Live Info page: This page provides an overview of the status of Intralox equipment using **real-time** operating data.

Settings page: This page provides **a 'Read and Write' interface**. This interface allows users to view current settings and make necessary adjustments.

Maintenance page: This page provides a comprehensive 'Maintenance Page' that displays absolute counter values.

Equipment page: This page provides users with the ability to view key operating parameters.

IO-comms page: This page provides a detailed overview of the communication status between the ISC CAM, field components, and the line PLC. This page is designed to provide line control engineers with real-time information about the system's operation.

Fault page: This page provides a 'Fault page' feature that displays the status of faults and warnings generated by the ISC CAM. This page is designed to provide all users with a clear and understandable overview of any issues that may arise during the system's operation.

Notice, if the fault sign turns orange or red there is a warning or fault active on the system. Please go to the fault page to further investigate the warning or fault.

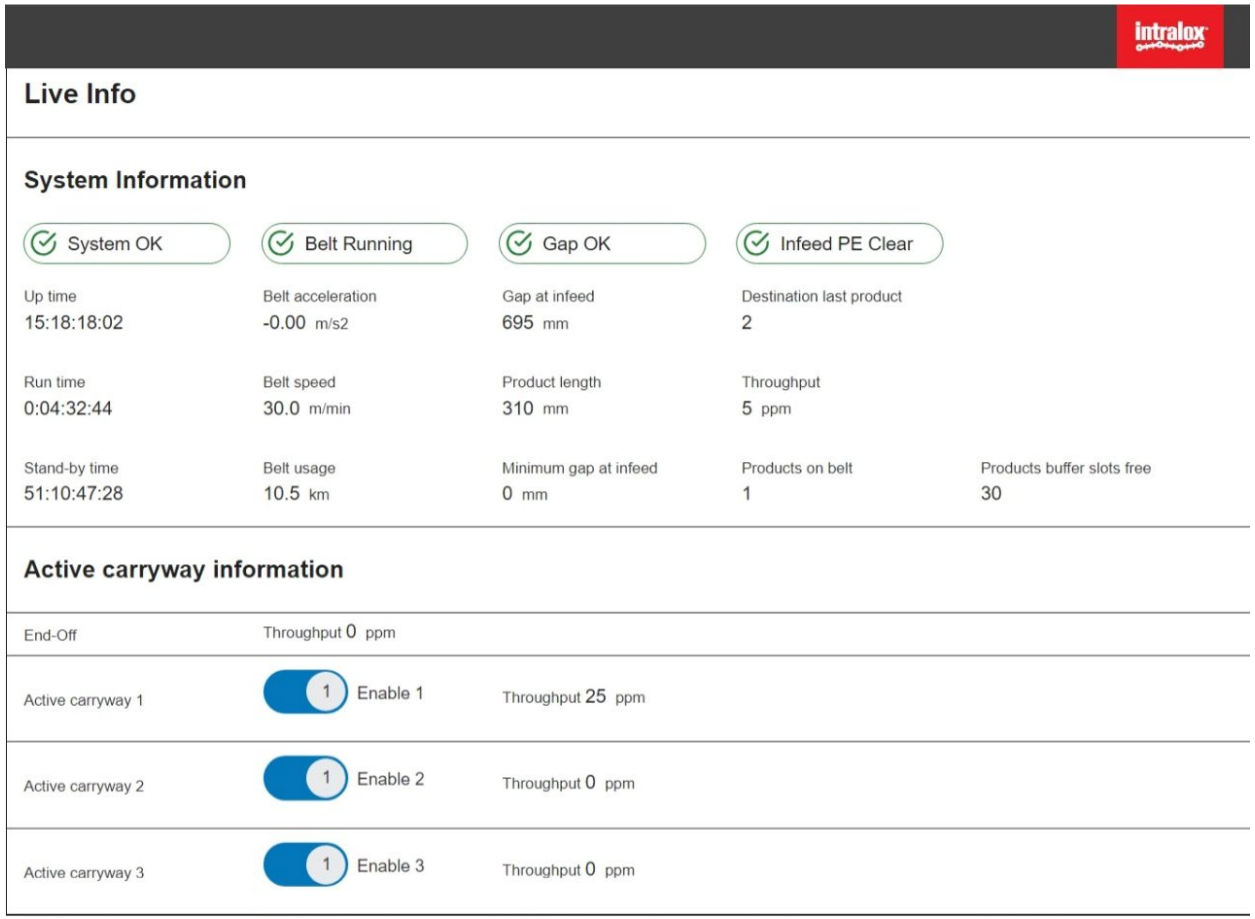
Information Bar

Example of an information bar

1. IDL-C Version: Intralox Divert Logic Version
2. DPE Model: Intralox Product Family
3. S/N: serial number of the Intralox equipment
4. Current Run mode
5. Connection status
6. IP Address of ISC CAM
7. MAC Address: electronic unique identifier

Live Info page

Example of a live info page



The 1st section – 'live info' -provides an overview of the status of Intralox equipment using **real-time** operating data.

This information is presented on the 'Live Info page', which provides a snapshot of the system's current operational status. The data is updated in close to real-time, ensuring that users have access to the most recent information.

The 2nd section 'active carryway information' provides the users the possibility to switch on/off the active carryway, and also provides the data of the throughput.

The 'Live Info page' page is designed for use by a variety of personnel, including equipment operators, controls engineers, and maintenance technicians. It provides a comprehensive overview of the system's status, enabling users to quickly identify and address any issues.

Please note that this is a general overview, and the specific details may vary depending on the exact model and configuration of your Intralox equipment.

Settings page

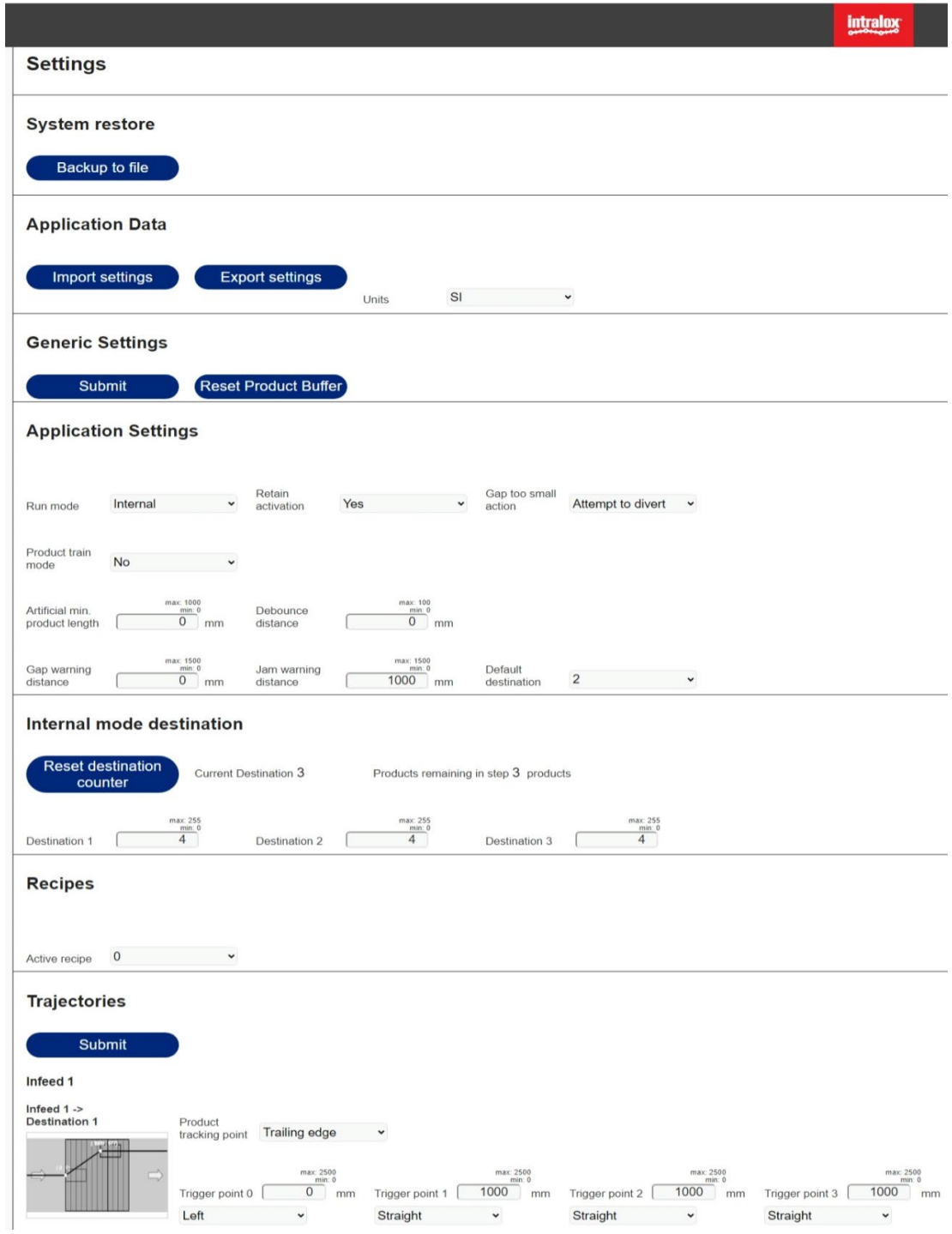
Intralox ISC CAM provides users with the ability to modify key operating parameters. This page is designed to optimize the trajectory of products as they move through the conveyor system.

The ISC CAM offers a ‘Read and Write’ interface. This interface allows users to view current settings and make necessary adjustments. Changes can be made to a variety of parameters, depending on the specific requirements of the operation.

In addition to manual adjustments, the system also provides the option to import and export ‘Application Setting Files’. These files contain pre-configured settings that can be used to quickly adjust the system to handle different types of products or operating conditions.

This page is particularly useful for technical operators, such as maintenance technicians, who are responsible for adjusting the performance of the Intralox equipment.

Please note that this is a general overview and the specific details may vary depending on the exact model and configuration of your Intralox equipment.



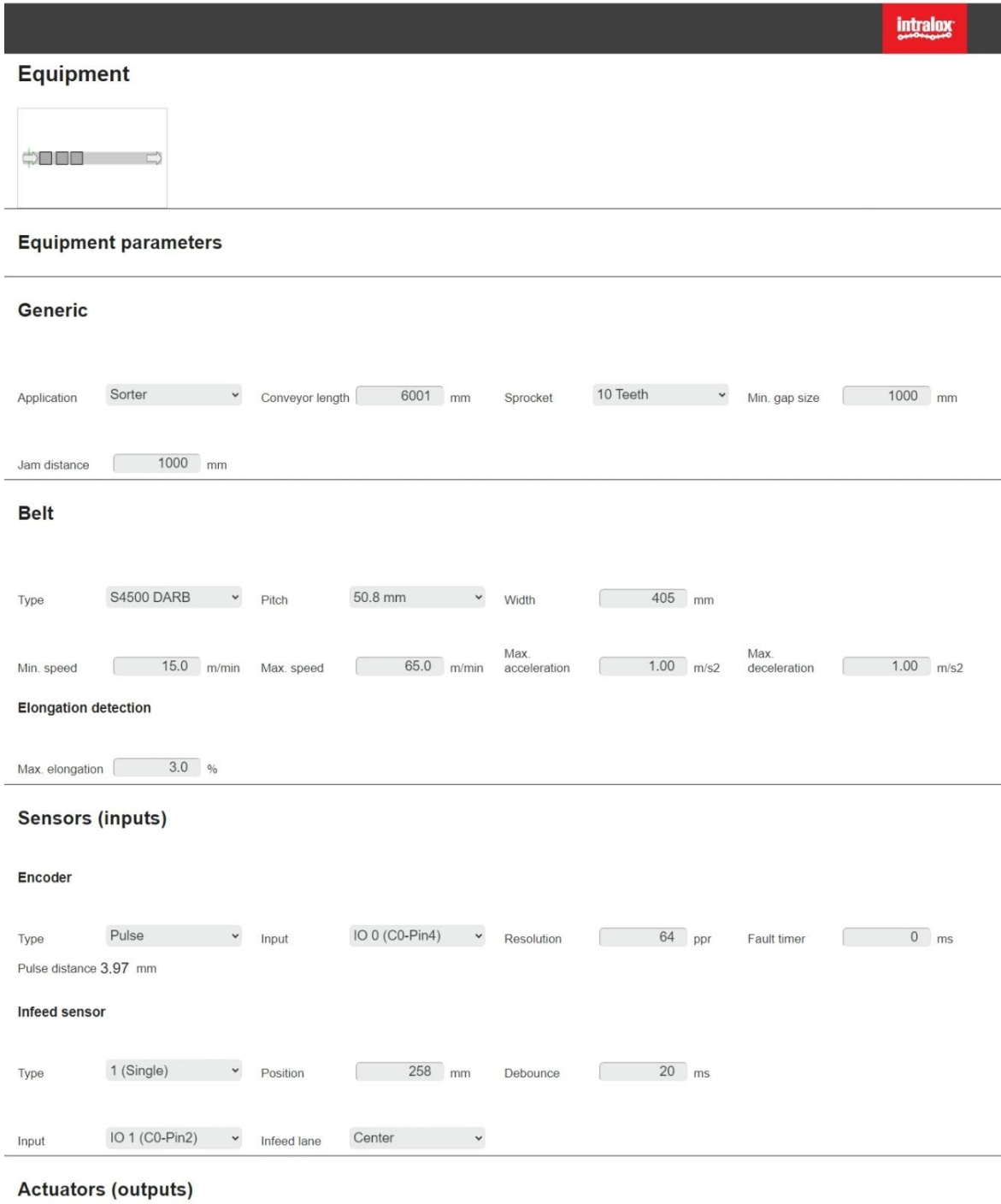
Equipment page

Intralox ISC CAM provides users with the ability to view key equipment parameters.

The ISC CAM offers a ‘Read’ interface for viewing the physical set up of the Intralox equipment. This feature is particularly useful for controls engineers who are integrating the ISC CAM into the Line network for communication purposes, and maintenance operators who are troubleshooting the system.

For more detailed information, please refer to the ‘Functional Layout and Mechanical Drawing’ section of the manual.

Please note that this is a general overview and the specific details may vary depending on the exact model and configuration of your Intralox equipment.



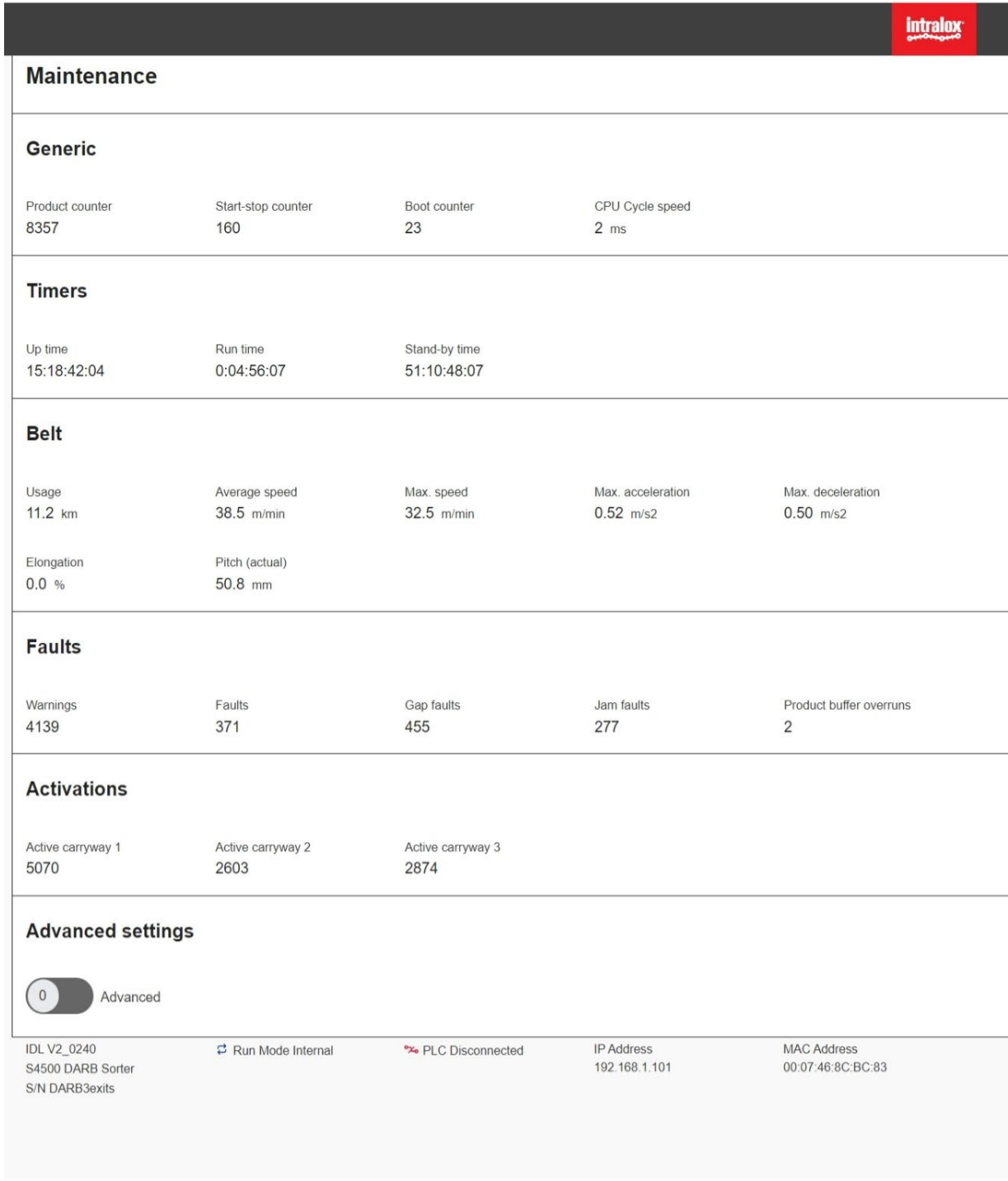
Maintenance Page

The ISC CAM equipment provides a comprehensive ‘Maintenance Page’ that displays absolute counter values. This page is designed to provide maintenance personnel with a detailed record of the system’s operation.

Most of the data in the ‘Maintenance Page’ is **‘Read Only’** . This ensures the integrity of the log data, preventing accidental modification. Despite being read-only, the system provides the ability to export counter files.

The ‘Maintenance Page’ is specifically intended for use by maintenance personnel. It provides them with valuable insights into the system’s operation, helping them identify potential issues and optimize the system’s performance.

Please note that this is a general overview and the specific details may vary depending on the exact model and configuration of your Intralox equipment.



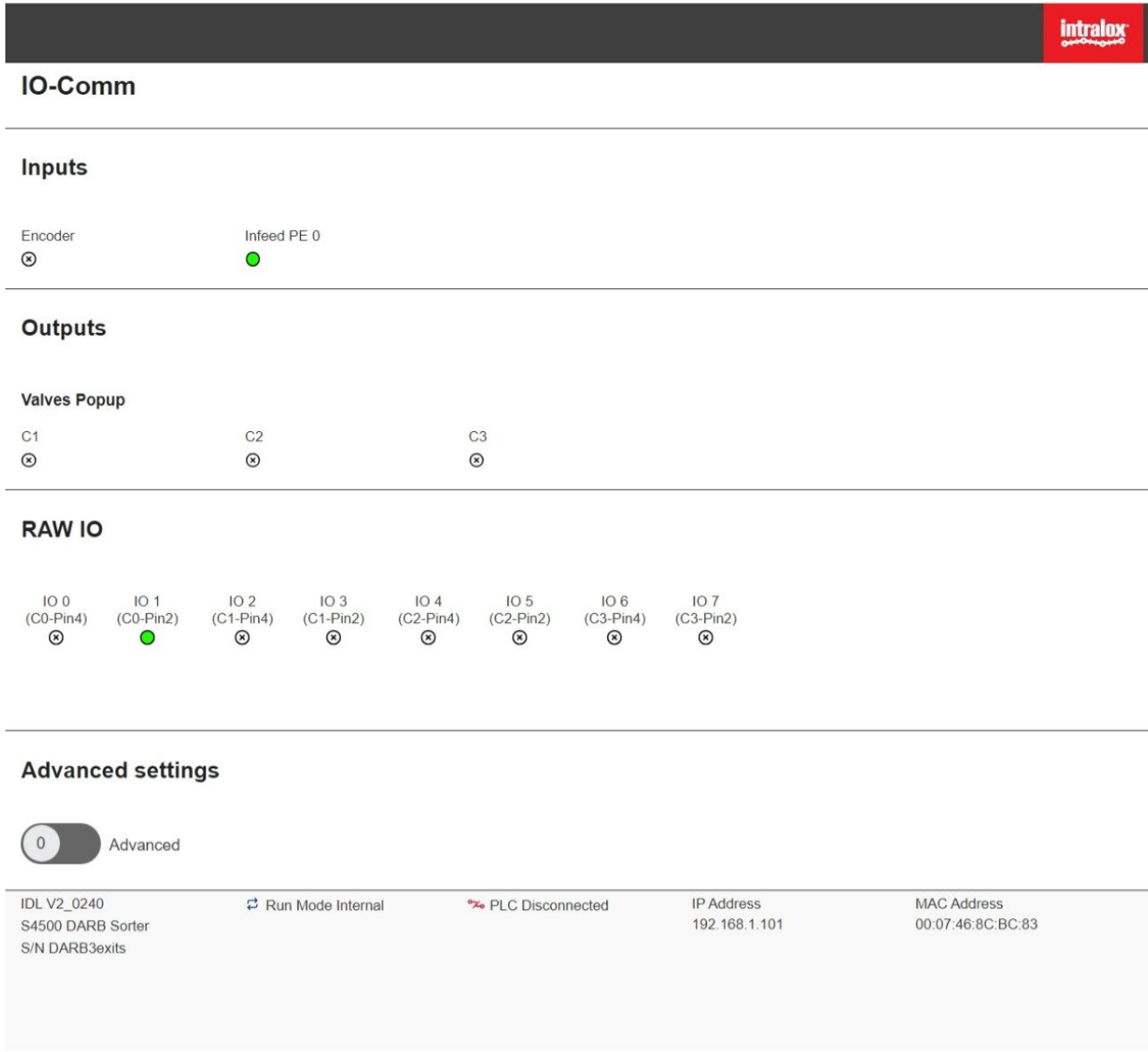
IO-COMM page

The Intralox ISC CAM provides a detailed overview of the communication status between the ISC CAM, field components, and the line PLC. This feature is designed to provide line control engineers with real-time information about the system's operation.

The most data of the 'IO-COMM page' 'Read Only'. This ensures the integrity of the data, preventing accidental modification. The interface provides a comprehensive overview of the system's communication status, helping engineers quickly identify and address any issues.

For more detailed information, please refer to the 'ISC CAM network communication' and the 'ISC Troubleshooting Document'. These documents provide additional information and actions that can be taken to troubleshoot the system.

Please note that this is a general overview and the specific details may vary depending on the exact model and configuration of your Intralox equipment.



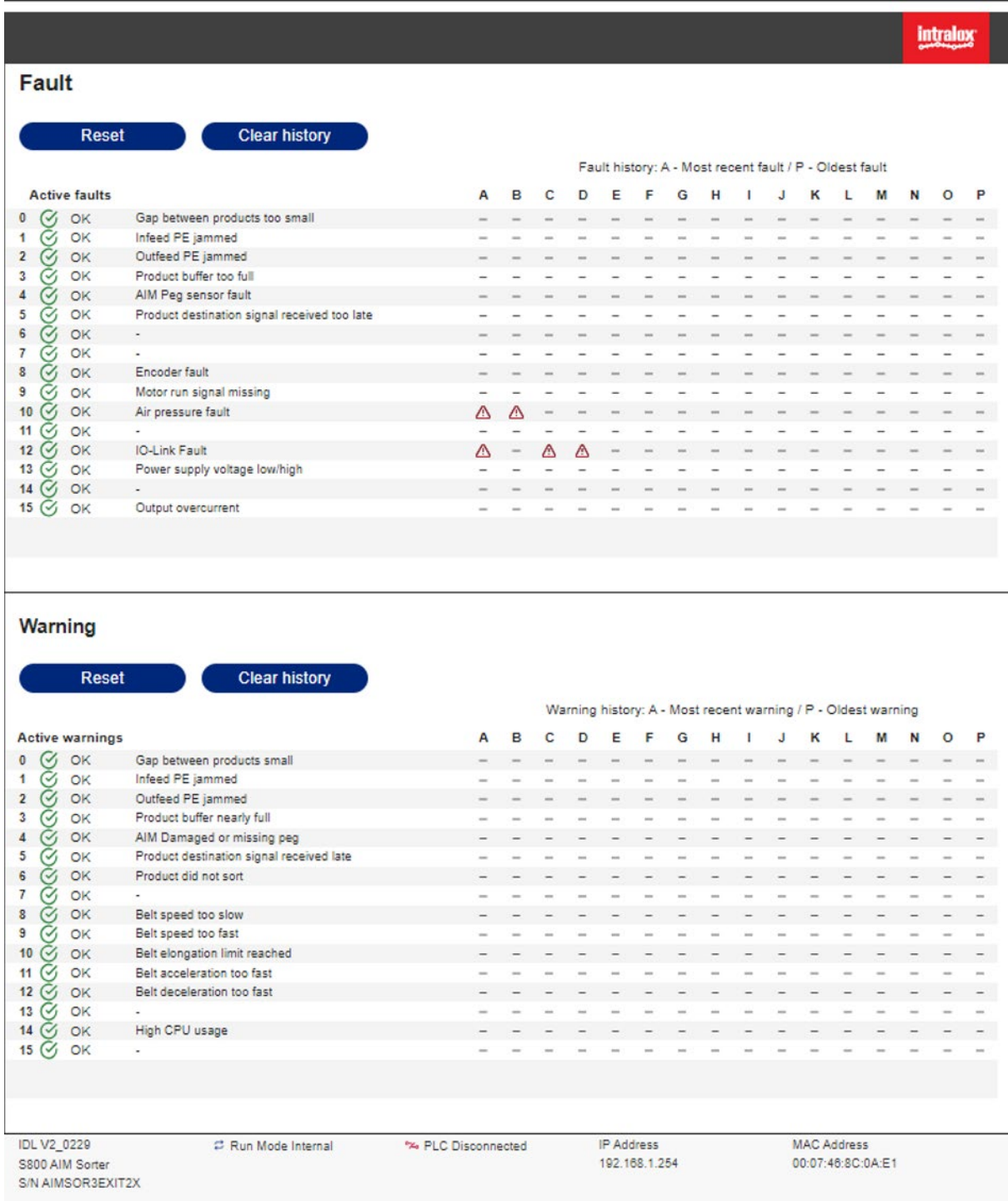
Fault page

The Intralox ISC CAM provides a ‘Fault page’ feature that displays the status of faults and warnings generated by the ISC CAM. This page is designed to provide all users with a clear and understandable overview of any issues that may arise during the system’s operation.

The ‘Fault page’ is presented in a human-readable interface. This ensures that users of all levels can easily understand the information presented. The interface provides a comprehensive overview of the system’s fault status, helping users quickly identify and address any issues.

For more detailed information about the faults and actions to be taken please see the ‘ISC Troubleshooting Document’. These documents provide additional information and actions that can be taken to troubleshoot the system.

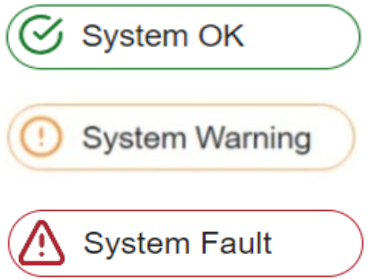
Please note that this is a general overview and the specific details may vary depending on the exact model and configuration of your Intralox equipment.



Basic

General indicators – System status & Belt status

System Status Indicators:
Operational (system OK), Cautionary (system warning), and Critical (system fault). Detailed information on cautionary alerts and critical malfunctions can be found on the “fault” interface page, which serves as a comprehensive repository for diagnostic information, aiding in proactive maintenance and troubleshooting.



System status Indicators:

Green Check Mark: No faults or warnings.

Orange Exclamation Mark: One or more warnings are active.

Red Exclamation Mark: One or more faults are active.

Belt Status Indicators:

Operational (Belt Running): A green check mark icon indicates the belt is running, based on encoder pulses.

Cautionary (Belt Stopped): An orange exclamation mark icon indicates the belt is not running. If this warning persists while the belt is running, it suggests a problem between the shaft-mounted encoder and the ISC.

General indicators - gap status Indicators

A **gap** refers to the distance between two consecutive items on the conveyor belt. This gap is crucial for the smooth operation of the system, as it allows for efficient item handling and prevents collisions. Maintaining an appropriate gap ensures optimal throughput and minimizes the risk of system jams.

Gap Status Indicators:

Operational (Gap OK): Green check mark indicates that gap on the previous product was sufficient.

Cautionary (Gap Warning): An orange exclamation mark icon indicates the gap on the previous product was small.

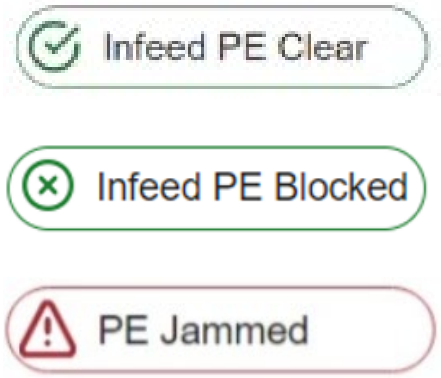
Critical (Gap too Small): A red exclamation mark icon indicates the gap on the previous product was too small, impeding system behavior.

“Gap warning” and “Gap too small”:

The gap warning’s trigger value for this warning can be found under “Gap Warning Distance” in the “application settings” on the “settings” page. This value can be set by the user and does not impact equipment function.

The trigger value of “gap too small” is **not adjustable,** it is a predetermined value, please refer to equipment layout.
Important: Look for the feature “Gap too small action” in the “application settings” on the “settings” page for more information.

General indicators – Infeed photo-eye



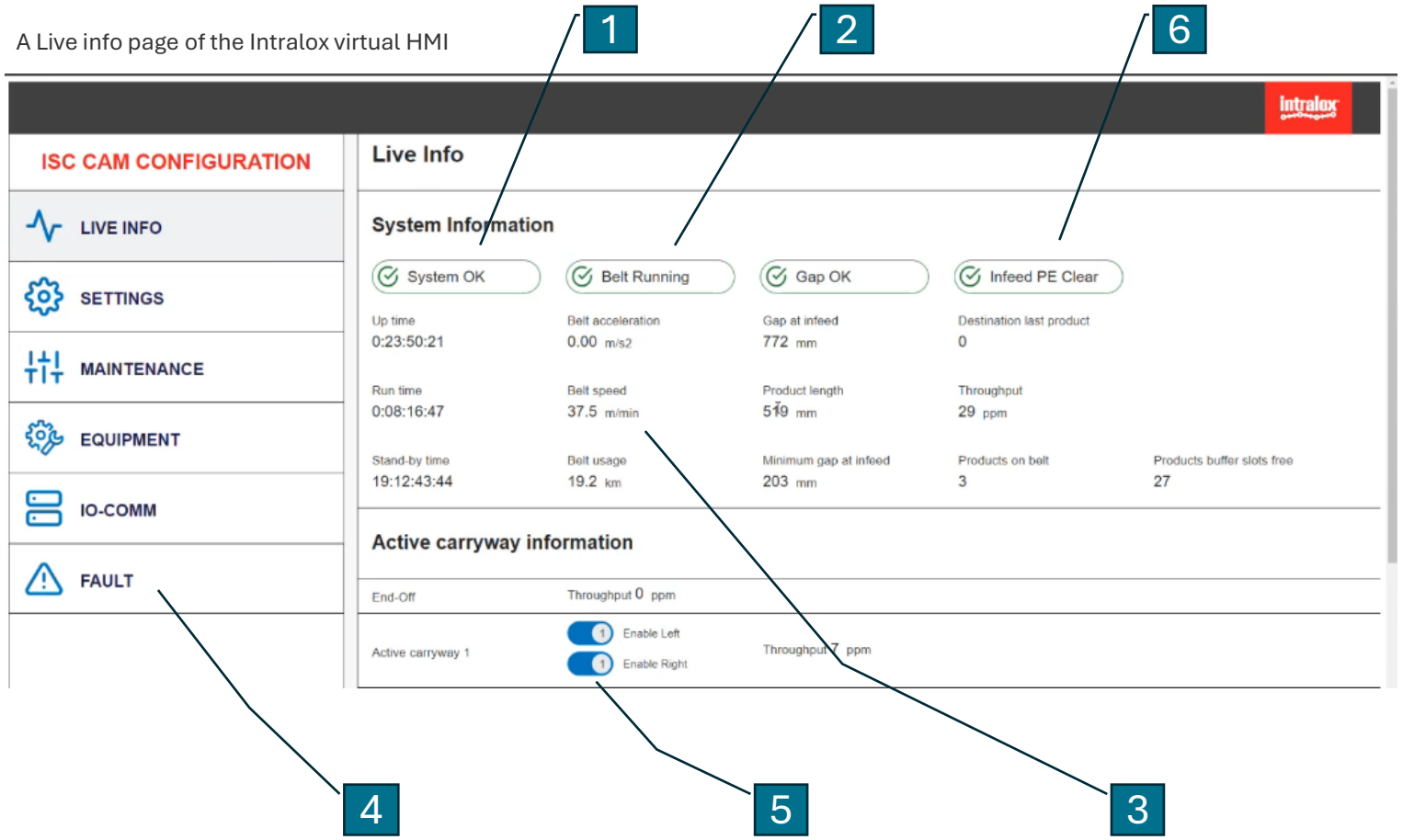
Infeed photo-eye Indicators:

Operational (Blocked/Clear): A green mark icon indicates no system malfunctions or cautionary signals.

Critical (PE Jammed): A red exclamation mark icon indicates a photo-eye is blocked for a critical amount of time. This indicator will clear once the photo-eye is unblocked.

Use live info to ensure proper equipment start

A Live info page of the Intralox virtual HMI

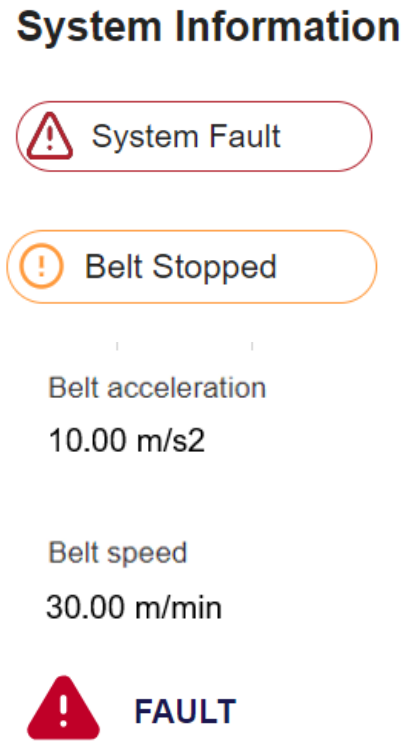


First Time to start a Intralox equipment:

1. Ensure the “System OK” is green.
2. Ensure the belt is running.
3. Check the belt speed, wait till it is unchanged. Belt speed in an acceleration or in a deceleration process, could cause an inaccurate or failed diverting action.
4. Check the system has no “Fault” indication. In case of a fault, please refer to the ISC webpage - “Troubleshooting guide”.
5. Enable the required active carryways.
6. Try to block the infeed photo eye, check the reaction of the “infeed PE clear” indication. If the “Infeed PE clear” reacts as should, the equipment is ready to be started. If “Infeed PE clear” doesn’t react correctly, refer to the ISC webpage - “Troubleshooting guide”.

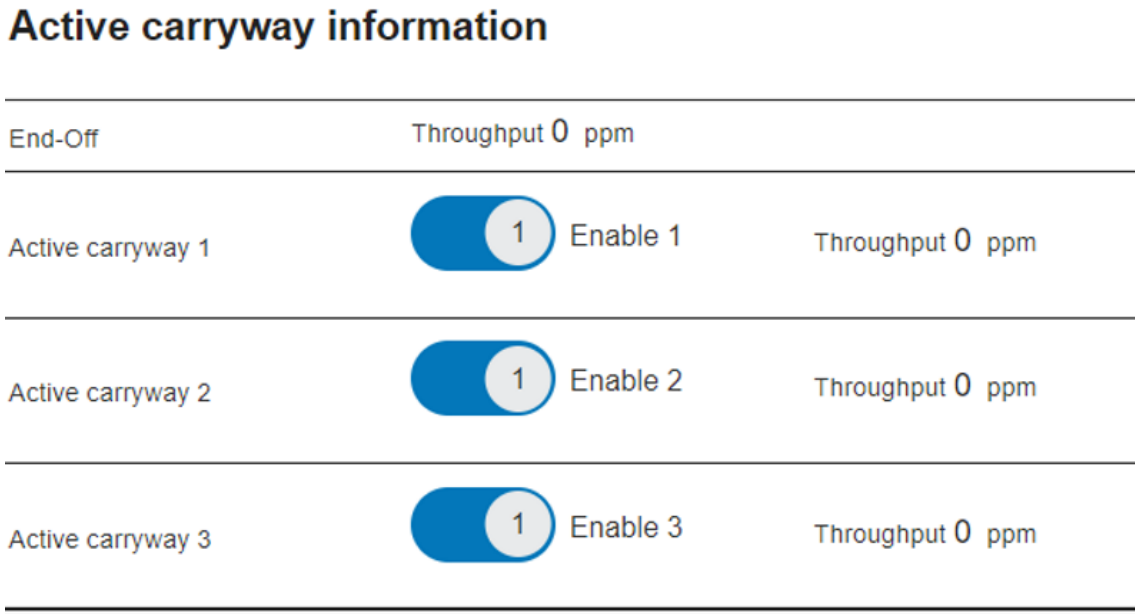
Use live info to ensure the equipment start

⚠ Attention: Any of the followed symbolic means the equipment is not ready， more detailed refer to ISC webpage – “ISC CAM Troubleshooting guide”.



- “System Fault” .
- “Belt stopped”
- Belt acceleration is not “0”, acceleration value may vary, due to rounding errors in the calculations.
- “Belt speed” is changing, speed value may vary, due to rounding errors in the calculations.
- Fault alarm

Active carryway information and toggle switch



End-off Throughput: Shows how many products per minute has been sent to end off. This is measured in products per minute (PPM).

Active Carryway (1-3) Throughput: Shows how many products per minute has been sent to each destination. This is measured in products per minute (PPM).

Toggle switches:

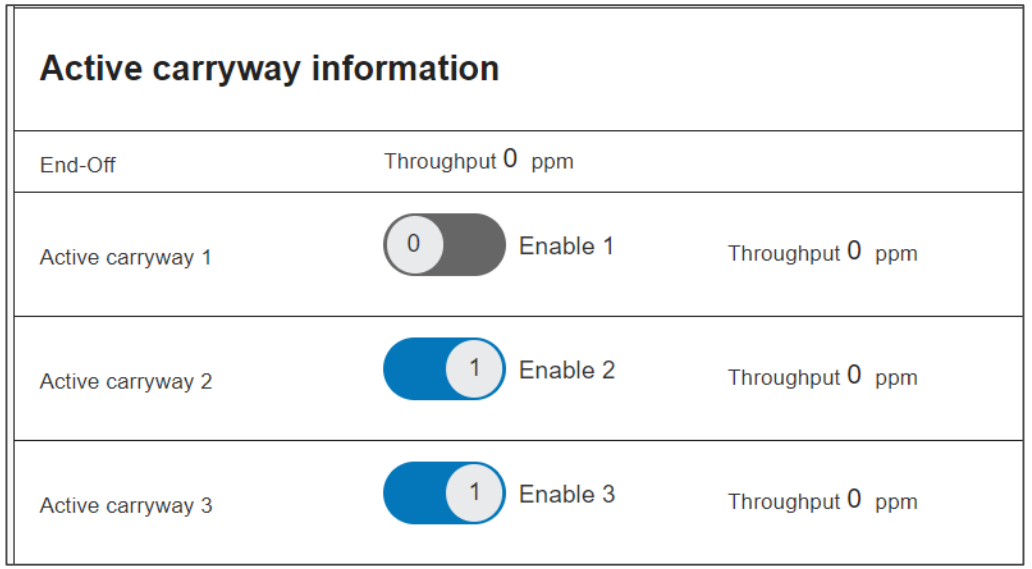
In sorter applications, there will be a selection of toggle switches labeled “Active Carryway”. Depending on your application, there may be one or multiple switches. These switches control whether the active carryway is enabled or not. Turning off an active carryway disables that section of the equipment, preventing the machine from sorting into this destination. Only the “Valve Override” setting will override this (refer to the “IO-COMM” page for more information on “Valve Override”).

Active carryway information and toggle switch – Examples

In a sorter application:

- Typical usage of turning off the active carryway:
  - when a line of exit or destination is full;
  - down-streamed machine is down for maintenance.
- The active carryway will react of the setting at the time of the next occurring of the product entering the active carryway

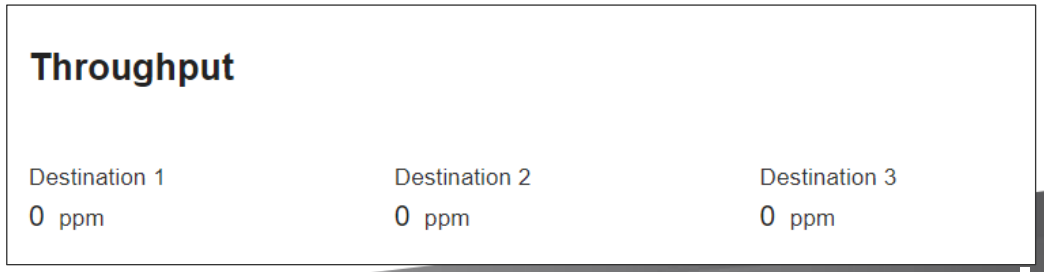
Active carryway information on the vHMI, 'live info' page of a Sorter application with 3 active carryways



In a switch application:

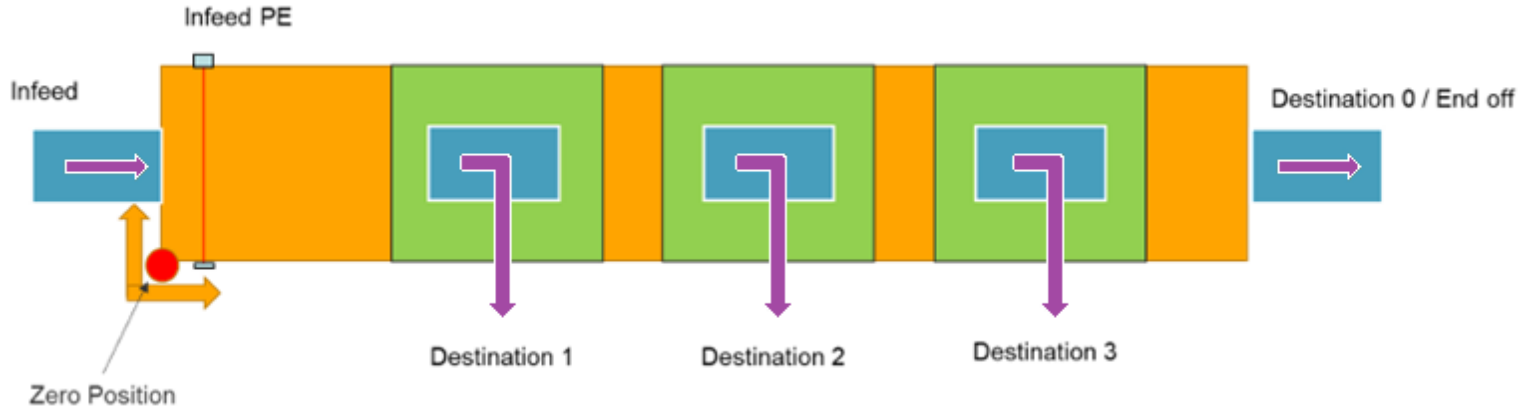
- The active carryway is enabled by default, the user is not allowed to enable/disable the active carryway.
- Only throughput information will be presented per destination.

A throughput information on the virtual HMI of an ARB Switch application with 3 destinations

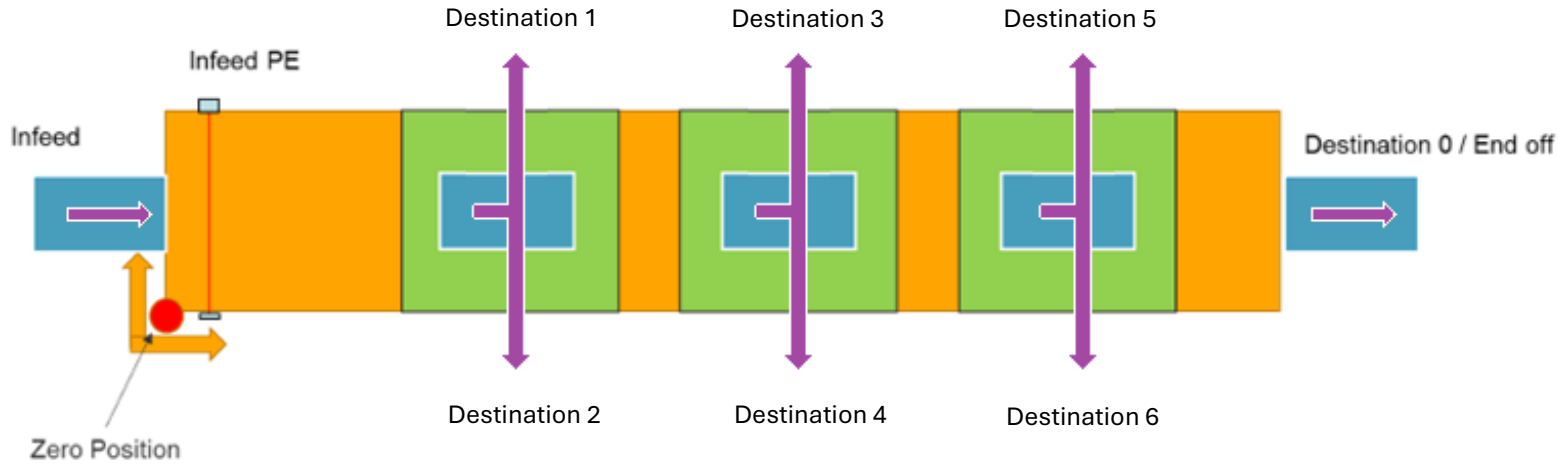


Active carryway destinations - Sorters

DESTINATIONS UNIDIRECTIONAL SORTER
AIM/DARB/S70X0



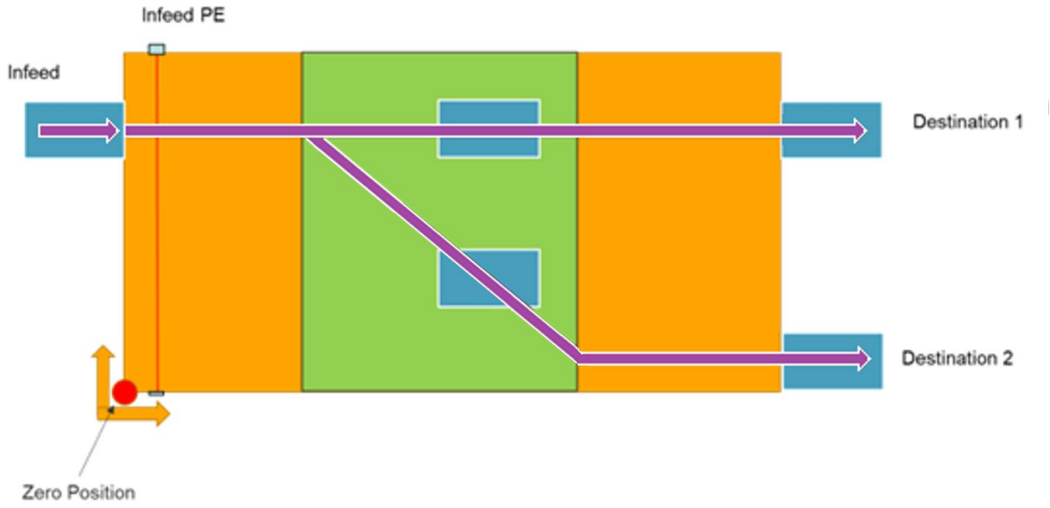
DESTINATIONS BIDIRECTIONAL SORTER
S70X0



Active carryway destinations - Switches

DESTINATIONS SWITCH 1-2

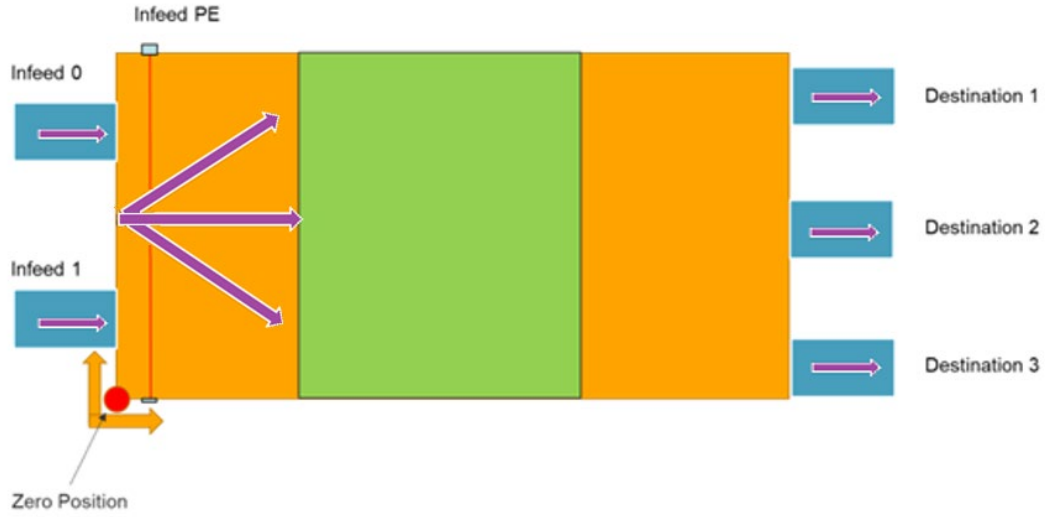
AIM/DARB/S70X0



DESTINATIONS SWITCH 1-3 / 2-3

S70X0

Only available for single infeed photo eye.



Determine the run mode

What is run mode?

Run Mode: Refers to the operational state of the system, determining how the conveyor is controlled. It can be set to either "Internal" or "External" mode.

- **External Mode:** The Programmable Logic Controller (PLC) controls destination selection, processing data from sensors or input devices to determine product destination.
- **Internal Mode:** The conveyor follows the configuration set in the "Internal Mode Destination" section, assigning specified number of products per destination.

How to decide which mode to use?

The choice between modes depends on the operation's specific requirements.

For dynamic control-based operations e.g., when product destination should be determined based on real-time inputs, External mode is preferred.

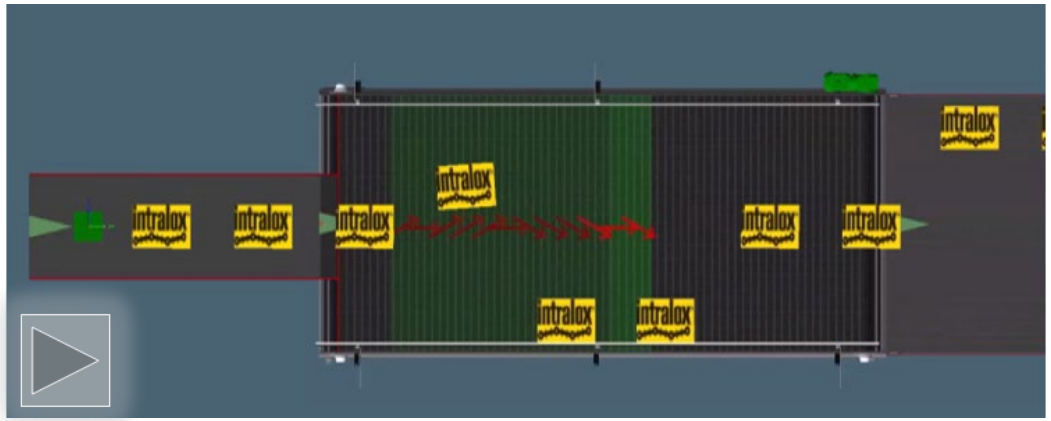
For predictable operations, Internal mode is preferred. Always refer to operational manuals or consult an Intralox expert for system-specific details.

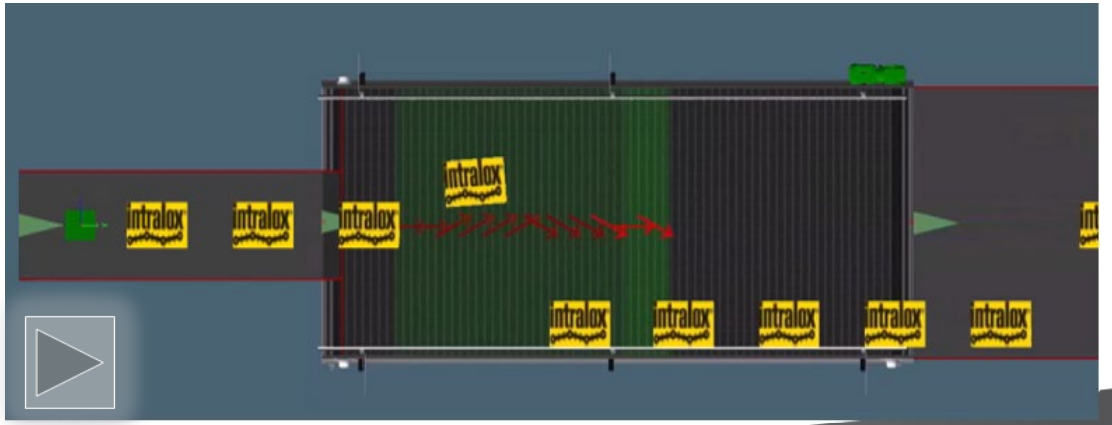
When is the typical scenario an Internal mode should be used?

- Typical application examples:
    1) A **sorter** equipment has 3 exits. In the production, the requirement is consistently to be two products to destination 1, two products to destination 2, two products to destination 3.
    2) A **switch** equipment has 3 destinations, in the production the requirement is consistently one product to left side, three products to middle positioned destination, five products to right side.
- The quantity of products to each destinations is settable.

Examples to the run mode - internal mode

These 2 videos show 2 example processes of an ARB S70X0 switches under internal mode of different settings to the destinations:

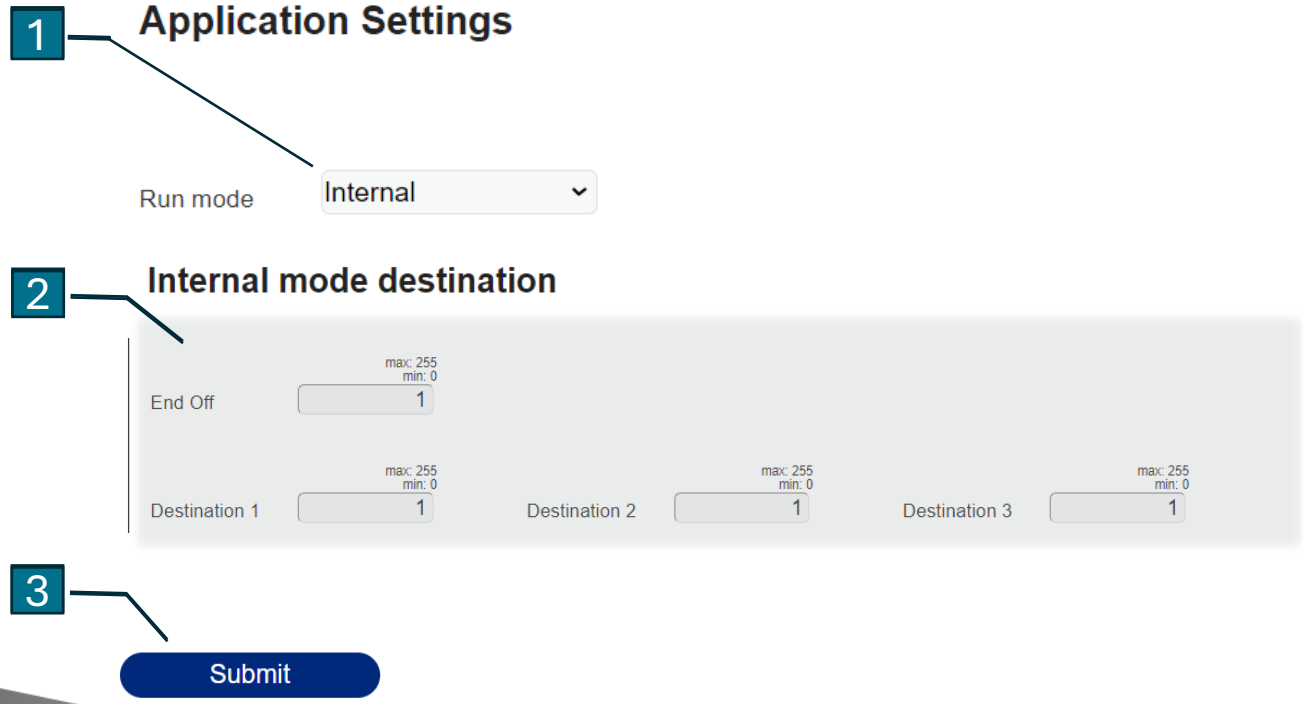




Internal mode and destination settings

How to set the internal mode and internal mode destinations in vHMI?

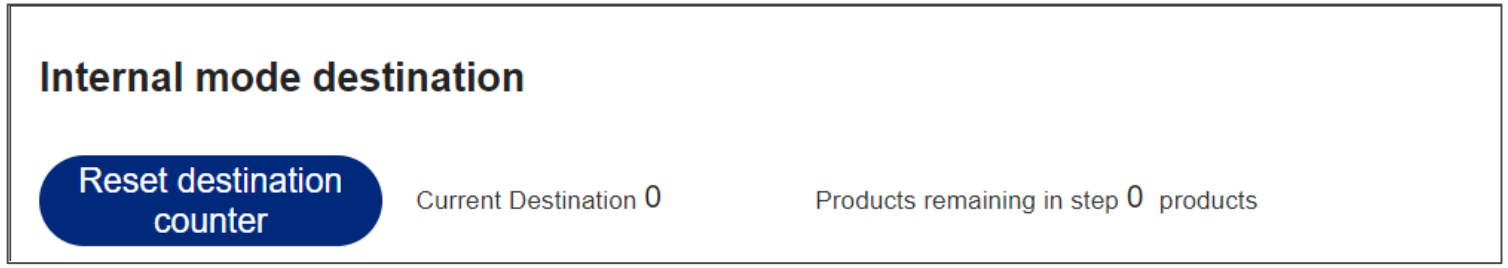
- Step 1: Select the Run mode to “Internal”
- Step 2: Set the numbers of the products to each destinations.
- Step 3: Submit the settings



Not able to select the run mode?

- If the ISC is connected to a line PLC, the setting from the PLC will overwrite the setting from the virtual HMI. As a result, though the screen will show the selected mode, but when the page is refreshed, it will revert to the mode which line PLC has command to ISC.
- In this case you must set the run mode in the line PLC.

Internal mode and destination settings

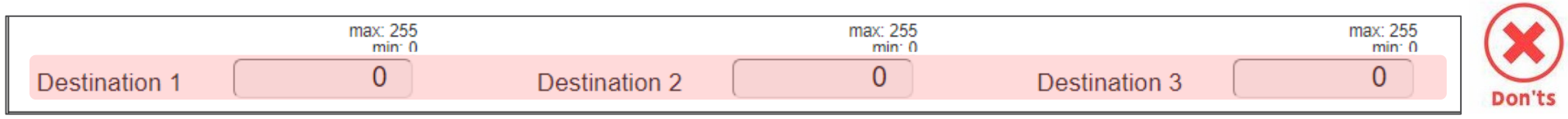


Reset destination counter:

- by pressing Reset destination counter, the IDL-C activates the new settings made on destination counters immediately and starts the internal count sequence from the start. ("Resetting" the destination counter)
- If reset destination counter is not pressed after changes to the destination counters, the IDL-C will finish its current internal count cycle completely before using the new settings.
- while resetting the destination counter, it also submits any changes that have been made in the settings page.

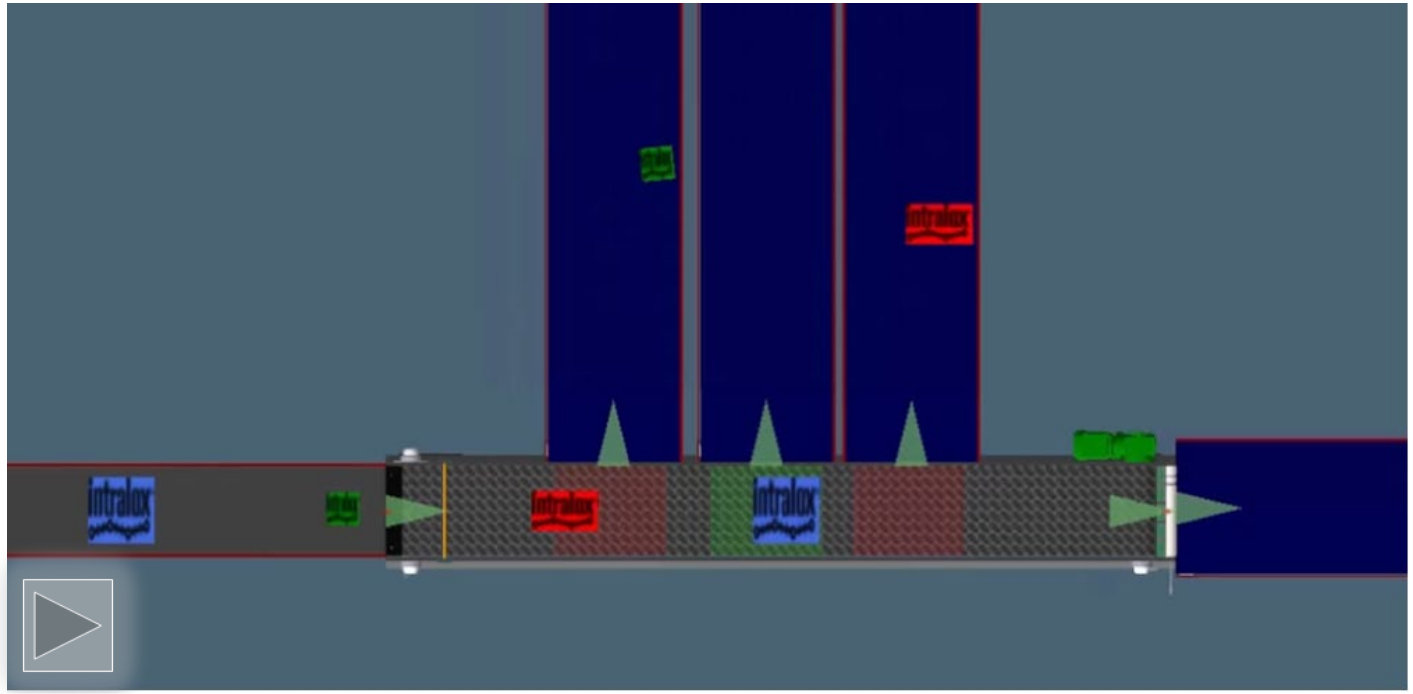
⚠ ATTENTION:

The system won't take the set, when the all destination including the End off action are set to 0.



Example to run mode – External /PLC mode

A good example for external mode:
the products are varied and will be fed in the equipment in a random sequence. The PLC defines that exit 1 is the destination for the product in green, exit 2 is for the product in blue, exit 3 is for product in red.



Application Settings

Run mode PLC / External

Note: PLC needs to send a destination signal before the product's leading edge hit the infeed product photoeye.

In case the signal is not timely received by ISC, a warning or fault will be generated. See section "Fault".

Retain activation

What is retain activation?

If the retain activation is selected as “yes”, the system can maintain the activation motion of the active carryway with the last product introduced until the next product enters the conveyor. Retain mode is available on all ARB/AIM technology, excluding DARB.

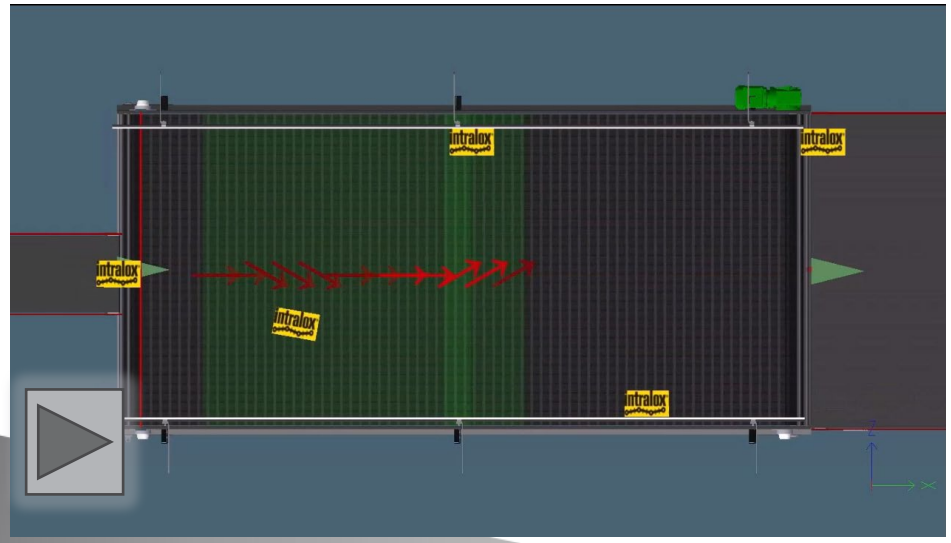
Retain activation on setting page

What’s the benefits to use retain activation?

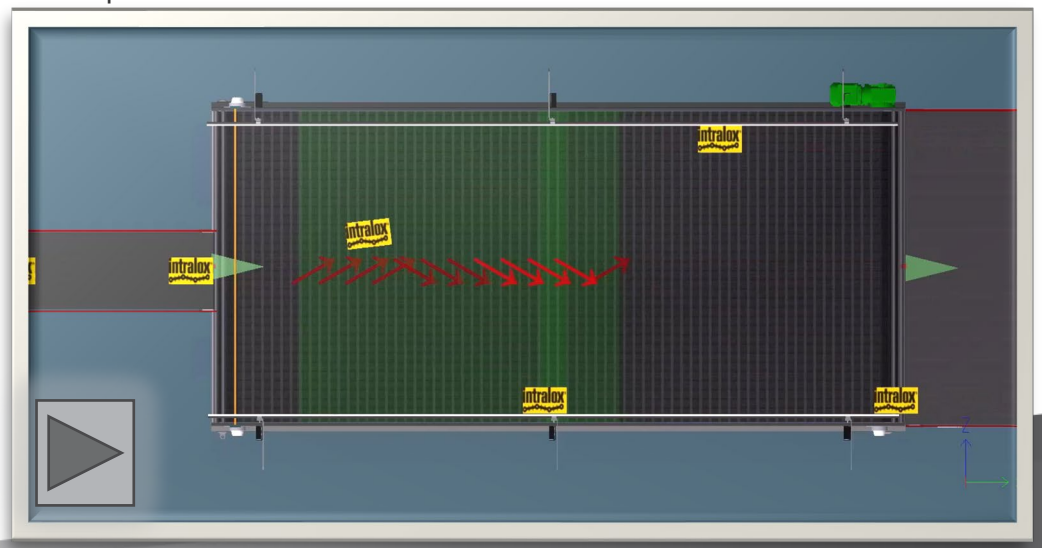
Retaining activation allows for quick resumption of operation without needing to reactivate components, it ensures consistent product handling, even during temporary stoppages or interruptions, and it enhances system reliability by ensuring smooth continuation of processes. It reduces also the noise level during the production.

Refer to operational manuals or consult an Intralox expert for system-specific details.

Example of S7000 switch retain activation off



Example of S7000 switch retain activation on



Production train mode

What is product train mode?

Product Train Mode: This mode allows products to accumulate on the conveyor, forming a ‘train’ of products with a small gap. The ‘train’ moves collectively along the conveyor line. This is beneficial for products requiring grouped processing or handling.

- **Grouped Processing**: Products are part of a single order can be grouped in a ‘train’ for streamlined packing and shipping.
- **Efficiency:** By moving a ‘train’ of products instead of individual ones, the system reduces movements, speeding up processing time and increasing throughput.

This mode enhances the conveyor system’s efficiency and throughput. Always refer to the system’s documentation or consult an Intralox expert for precise information.

What will happen, when products train mode is on?

When the production train mode is on:

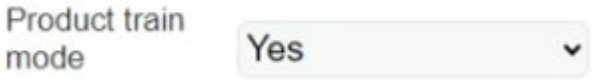
- gap errors are ignored;
- the jam detection mechanism is disabled;
- internal mode destination counter does not increment until a gap bigger than minimum gap is detected.

How can I set a products train?

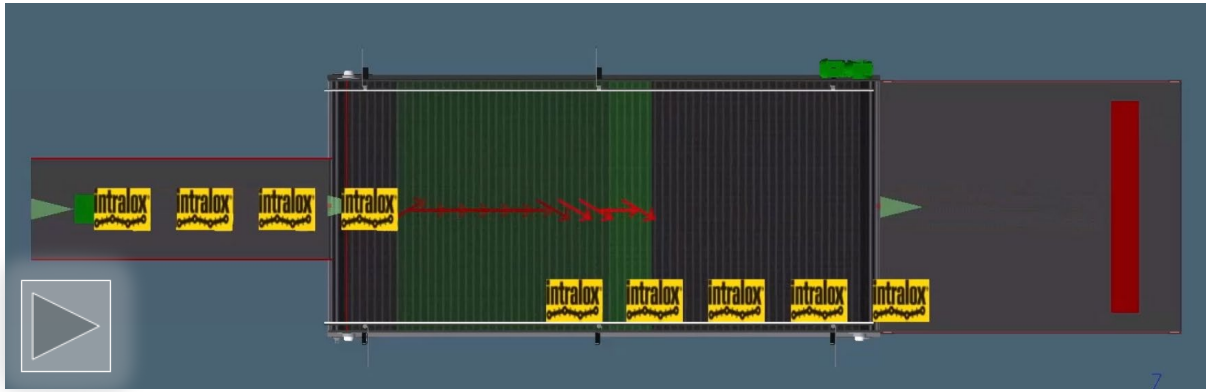
- Using the gap warning setting could help you to identify a product slug.
- If the product gap is less than the minimum gap, it is considered part of the slug.
- If the gap between products is greater than the minimum gap, it is considered a new slug.

Production train mode

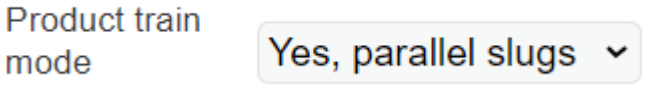
Product Train Mode: Yes



An example of product train mode:

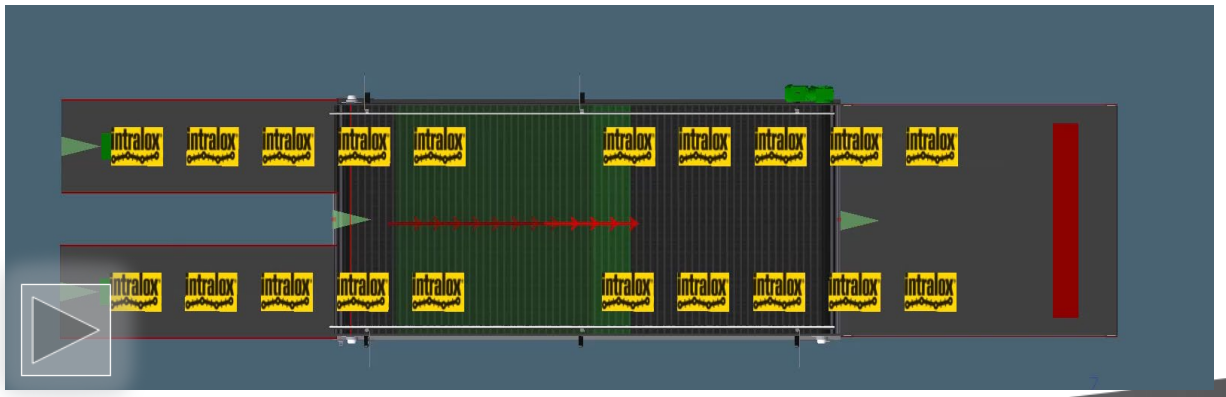


Product Train Mode: parallel slugs



This allows multiple infeed lanes to pass straight through as slugs using a single infeed Photo eye.

An example of parallel slug's train mode:



Fine tune the product divert

Fine tune the product divert

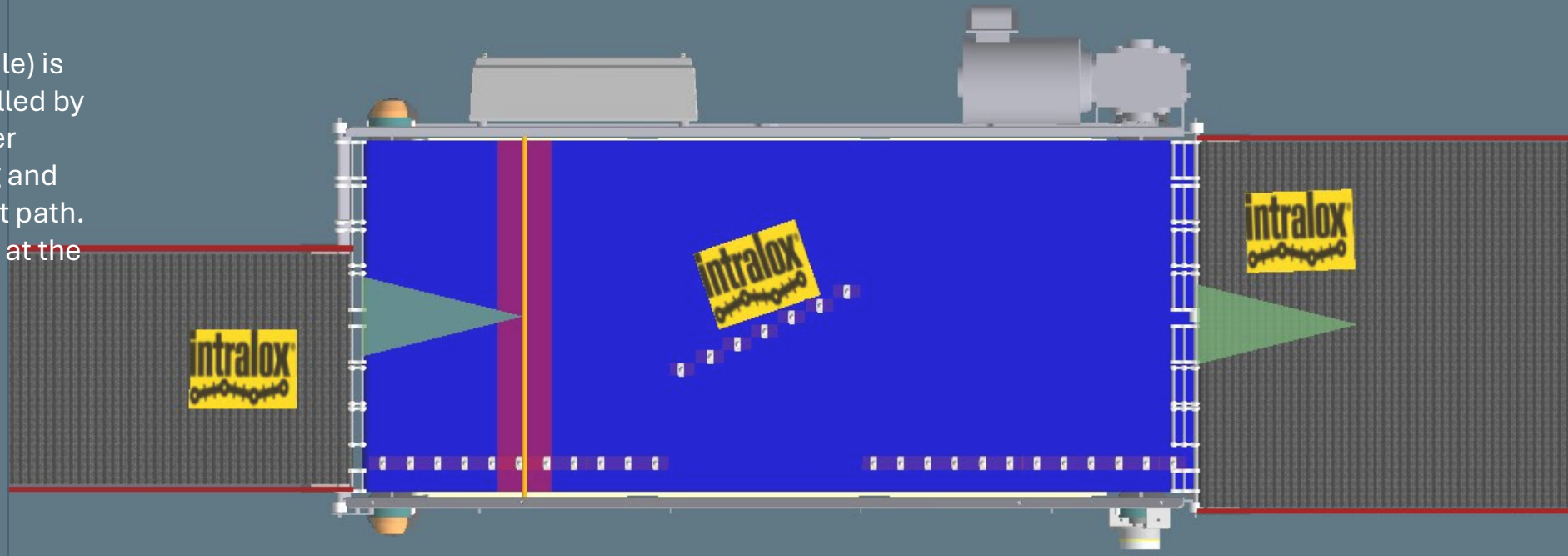
This chapter provides detailed guidance on how to fine-tune the conveyor system to optimize performance across different technologies. Each technology has unique features and settings that can be adjusted to meet specific operational requirements.

- **AIM:** Active Integrated Motion™ (AIM) is a product line designed to handle primary packaging—specifically tray packs—in the meat, poultry, and seafood industries. AIM can be used in other primary and secondary packaging environments but must be evaluated on an application-by-application basis.
- **DARB:** The Dual-Stacked Angled Roller™ Belt (DARB) Sorter S4500 is designed to divert products at a 90-degree angle relative to the belt travel direction. This technology allows adjusting the product tracking point (Leading edge, Center and Trailing edge) as well as the trigger point and divert distance dwell adjustments on the active carryway. These settings can be found in the trajectory part of the settings screen.
- **S70X0:** The ARB S70X0 is a versatile technology that accepts products and distributes them to multiple outfeeds. It can divert products bidirectionally at an angle, up to 35 degrees, relative to the conveyor belt travel direction. This technology allows adjusting the product tracking point (Leading edge, Center and Trailing edge), which will affect the product orientation. It is also possible to adjust the trigger point(s) and divert distance dwell on the active carryway. These settings can be found in the trajectory part of the settings screen.

AIM: optimize the excise of the divert paddle

Active Integrated Motion™ (AIM) is a product line designed to handle primary packaging—specifically tray packs—in the meat, poultry, and seafood industries. AIM can be used in other primary and secondary packaging environments but must be evaluated on an application-by-application basis.

The activated diverter paddle (paddle) is pneumatically powered and controlled by an ISC CAM. The pneumatic cylinder retracts to turn and redirect the peg and products in the pre-machined divert path. This action is what moves products at the trajectory.



AIM : Product Nose and Tail

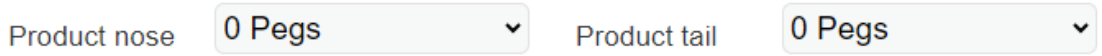
What is product nose, what is product trail?

Product Nose: The Product Nose (blue arrow) will artificially extend the product length on the leading edge of the product. This allows to add pegs in front of the product that may assist in properly diverting the product.

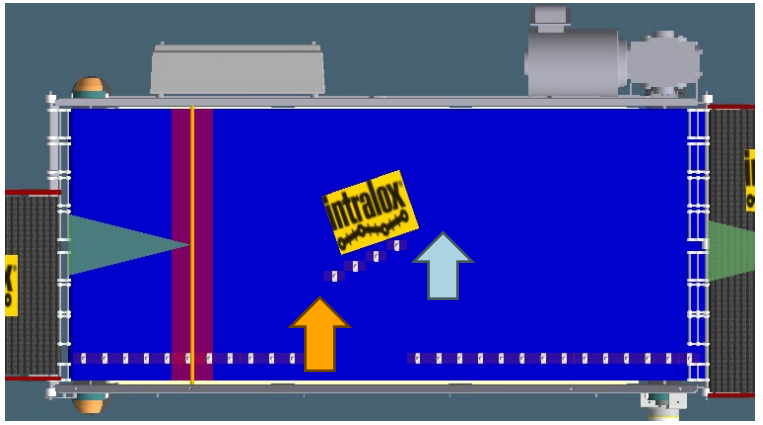
Product Tail: The Product Tail (orange arrow) will artificially extend the product length on the trailing edge of the product. This allows to add pegs behind the product that may assist in properly diverting the product.

How to set the product nose and product trail?

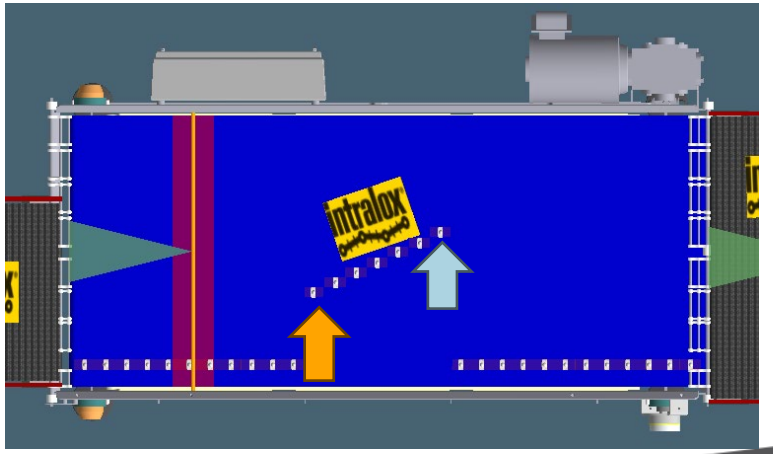
Product nose / tail can be set as number of pegs.



No Nose or Tail applied



Nose (blue pfeil) and Tail (orange pfeil) applied



AIM: activation/deactivation delay overrides

Activation Delay Active Carryway: This parameter accounts for mechanical delays from valve activation signal to activated carryway.
Crucial in AIM-applications where timing precision is essential to avoid incorrect product sorting.

De-activation Delay Active Carryway: This parameter accounts for mechanical delays from valve deactivation signal to deactivated carryway.
Crucial in AIM-applications where timing precision is essential to avoid incorrect product sorting.

Note: This parameter is specific for the AIM technology. In the AIM technology, in certain situations a "belt jump" could occur, which would require modification on the activation/deactivation delay override to eliminate this phenomenon. More detail see "ISC CAM troubleshooting guideline".

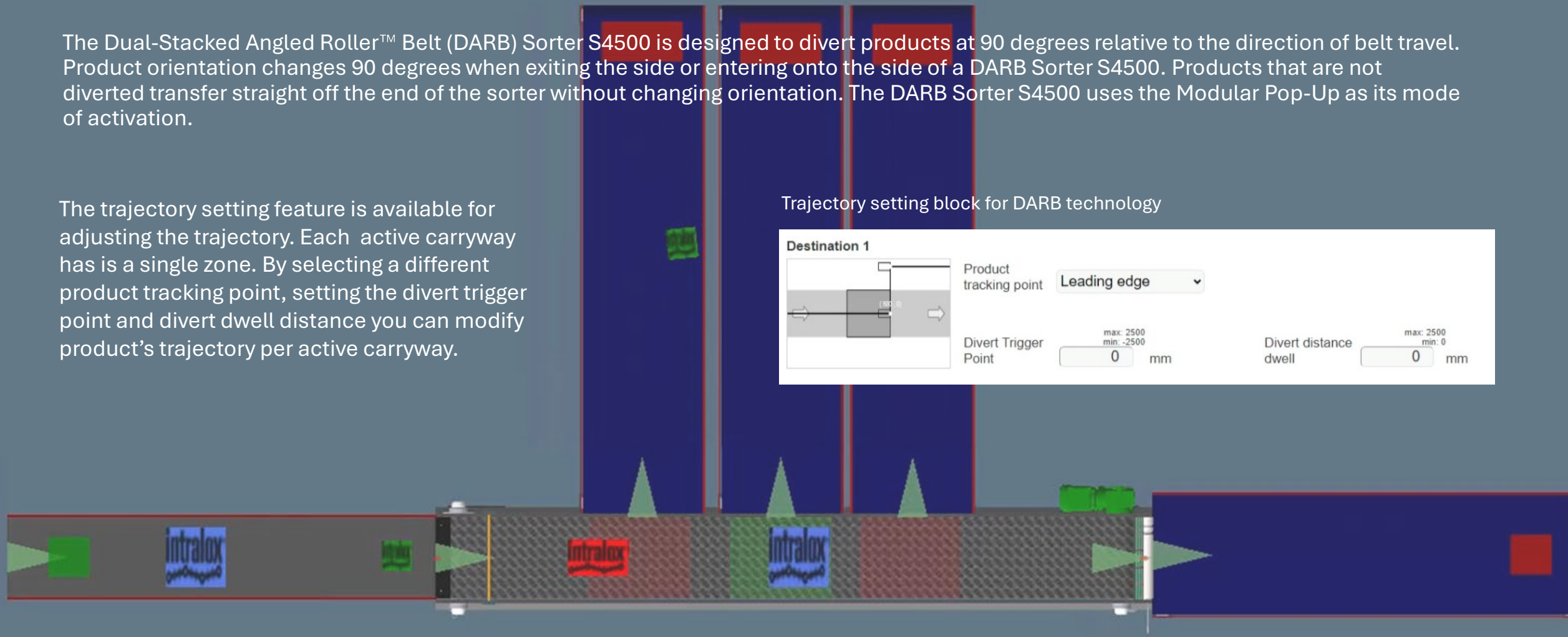
The specifics of this parameter vary based on the conveyor system and application. Always refer to the system's documentation or consult an Intralox expert for precise information.

DARB: Fine tune the divert by trajectories

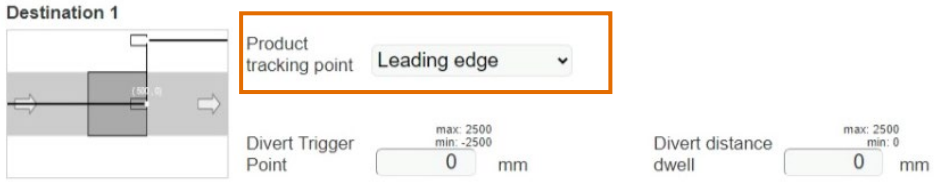
The Dual-Stacked Angled Roller™ Belt (DARB) Sorter S4500 is designed to divert products at 90 degrees relative to the direction of belt travel. Product orientation changes 90 degrees when exiting the side or entering onto the side of a DARB Sorter S4500. Products that are not diverted transfer straight off the end of the sorter without changing orientation. The DARB Sorter S4500 uses the Modular Pop-Up as its mode of activation.

The trajectory setting feature is available for adjusting the trajectory. Each active carryway has is a single zone. By selecting a different product tracking point, setting the divert trigger point and divert dwell distance you can modify product's trajectory per active carryway.

Trajectory setting block for DARB technology

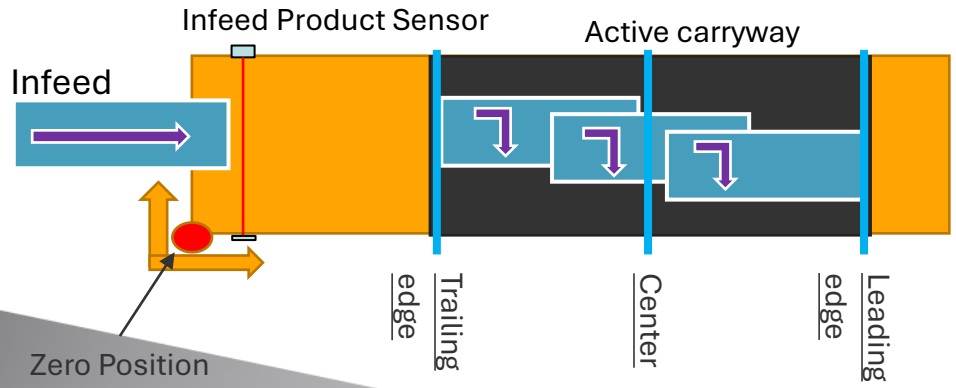


DARB: Product tracking point

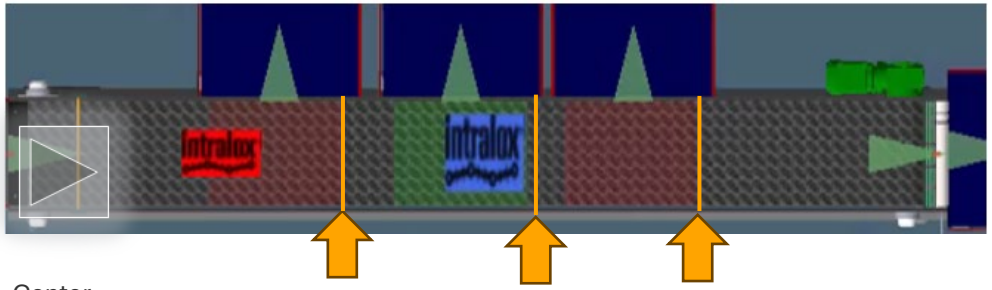


What is product leading edge, center and trailing edge?

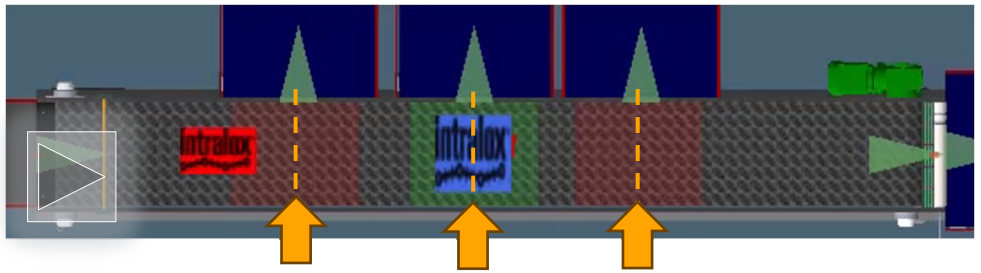
- **Leading edge:** Activation is triggered when leading edge of the product reaches the end of activation area.
- **Center:** Activation is triggered when center of the product reaches the center of the activation area
- **Trailing edge:** Activation is triggered when trailing edge of the product reaches the start of activation area.



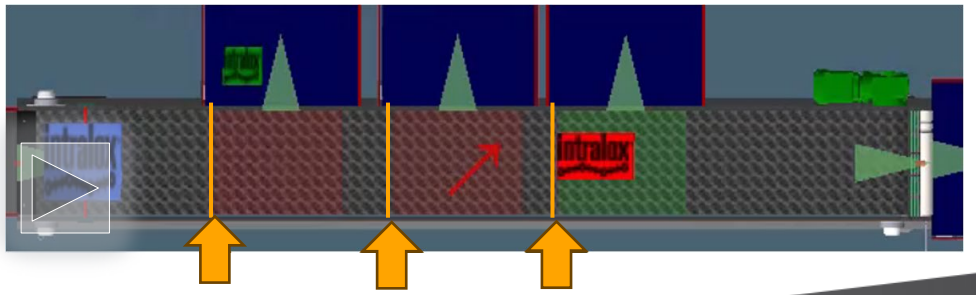
Leading edge



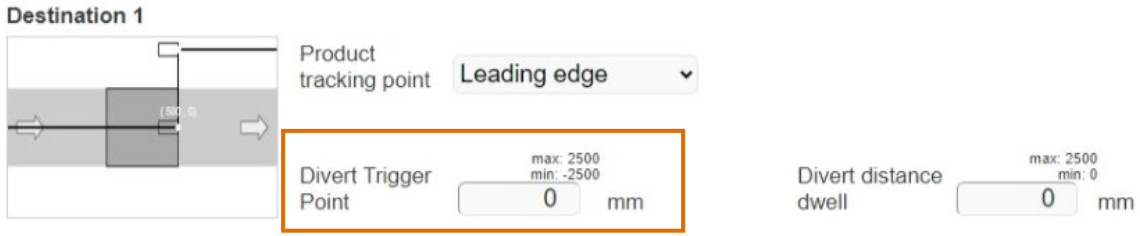
Center



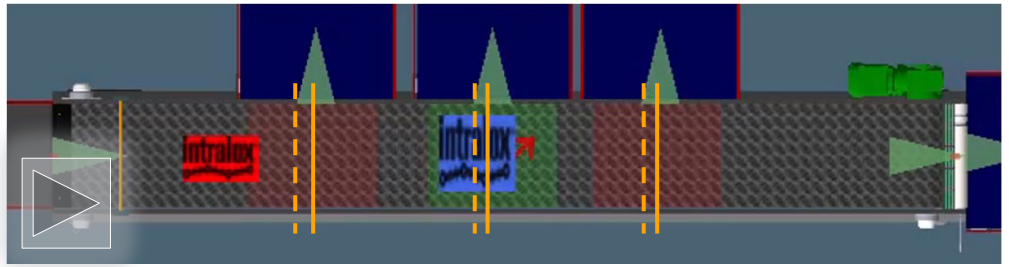
Tailing edge



DARB : Divert trigger point

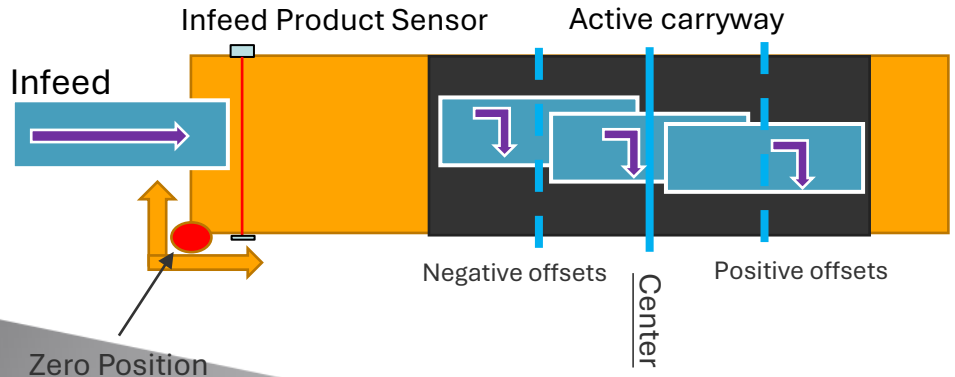


Center w/ Negative offset

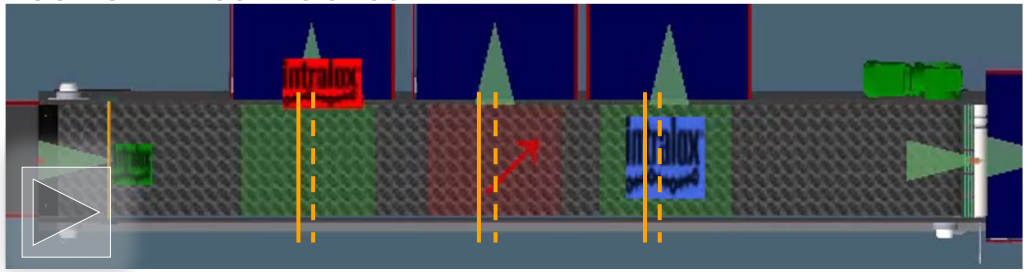


Divert trigger point: Allows to finetune the position where the product is being diverted by applying an offset to the tracking point:

- **Negative offsets:** will shift the divert point towards the infeed,
- **Positive offsets:** will shift the divert point towards end of conveyor.



Center w/ Positive offset



DARB: Divert distance dwell

What is divert distance dwell?

The ‘Divert distance dwell’ feature is designed to regulate the extent of sideway movement during activation.

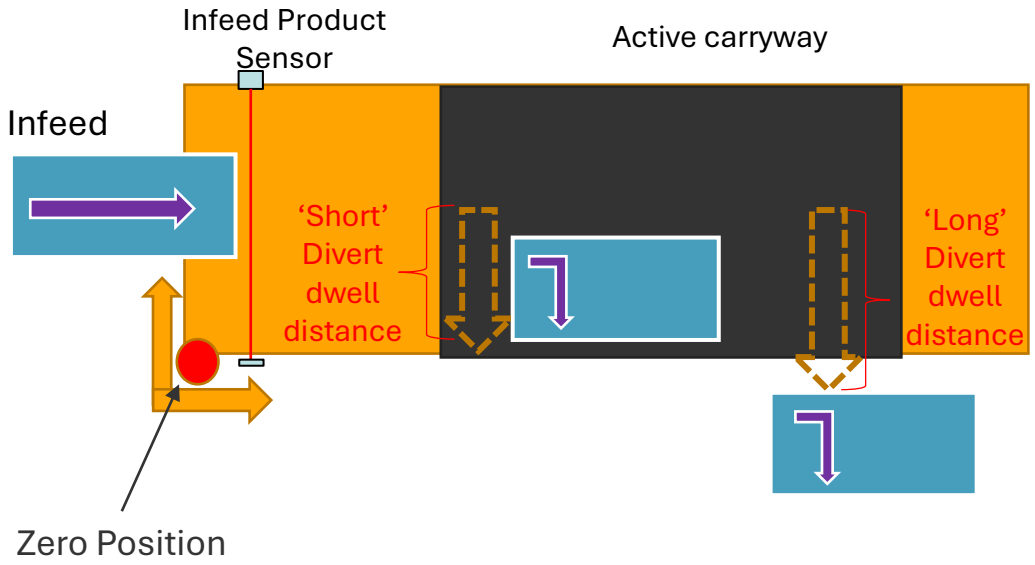
On the settings page, under the trajectories section, it’s possible to modify the ‘Divert Distance Dwell’ value. Any value greater than 0 will be used to determine the duration of activation.

Default value:

If the value is left by ‘0’, the divert distance dwell will use a default value. The default value is the width of the active carryway zone.

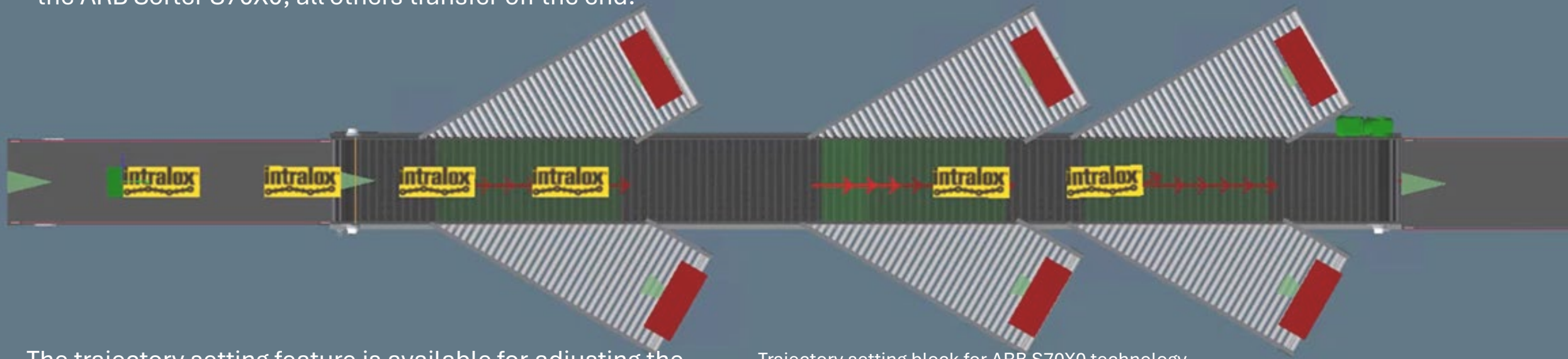
Restriction of the value settings:

This feature exhibits different behaviors for the ‘leading edge’ compared to the ‘center’ or ‘trailing edge’ for the DARB:
For the ‘center’ or ‘trailing edge’, the value can exceed the belt width.
However, for the ‘leading edge’, the value is restricted to the belt width.
This distinction is crucial for the proper functioning of the DARB.



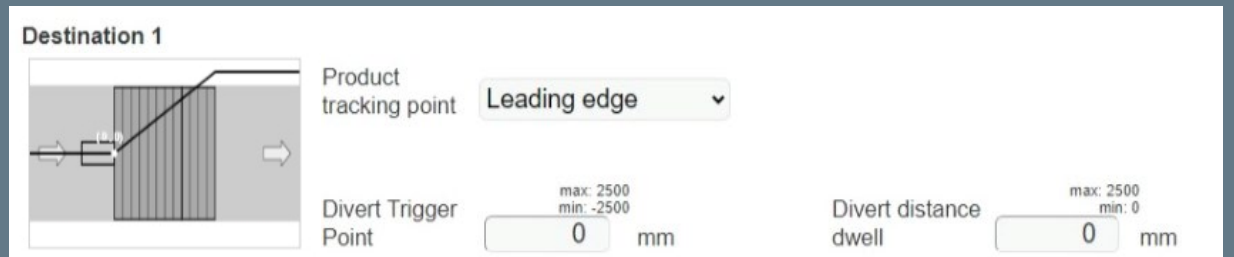
S70X0 sorters: Fine tune the divert per trajectories

The ARB Sorter S70X0 accepts one (1) infeed of products onto the equipment and distributes the products to multiple outfeeds such as spurs or chutes. It offers unidirectional, high-speed sortation for a wide variety of products. It can also bidirectionally divert products at an angle, theoretically up to 35 degrees, relative to the direction of conveyor belt travel. As products travel across the conveyor belt, their orientation remains relatively unchanged. Sorted products exit off the side of the ARB Sorter S70X0, all others transfer off the end.



The trajectory setting feature is available for adjusting the trajectory. Each active carryway there is a single zone. By selecting a different product tracking point, setting the divert trigger point and divert dwell distance to modify product's trajectory per active carryway.

Trajectory setting block for ARB S70X0 technology



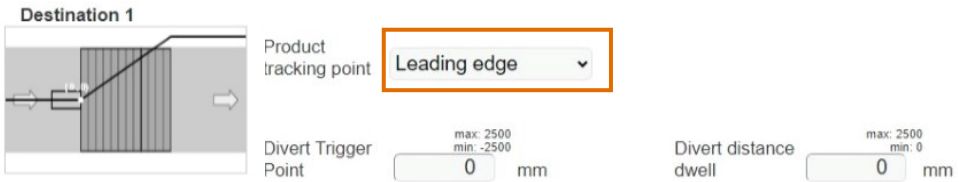
S70X0 sorter: Product tracking point

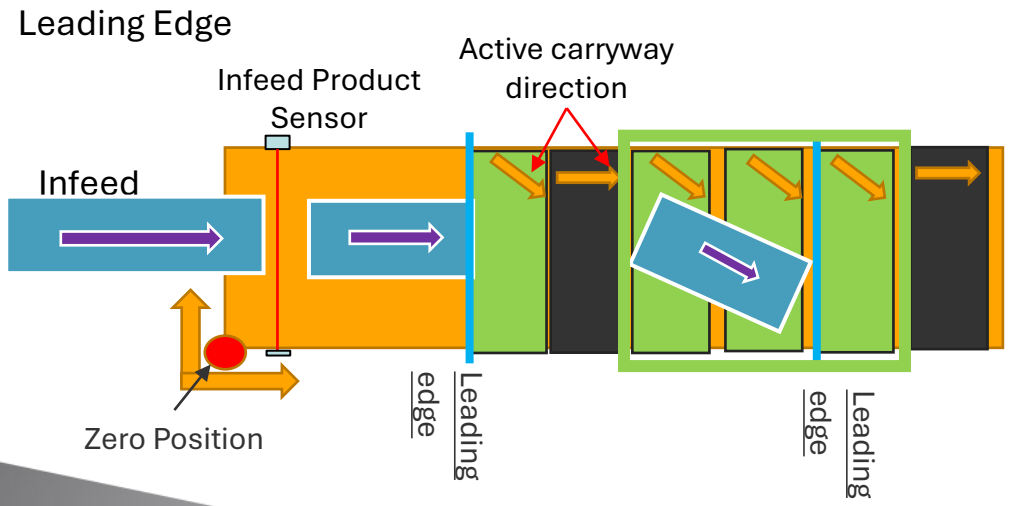
What is leading edge, center and trailing edge?

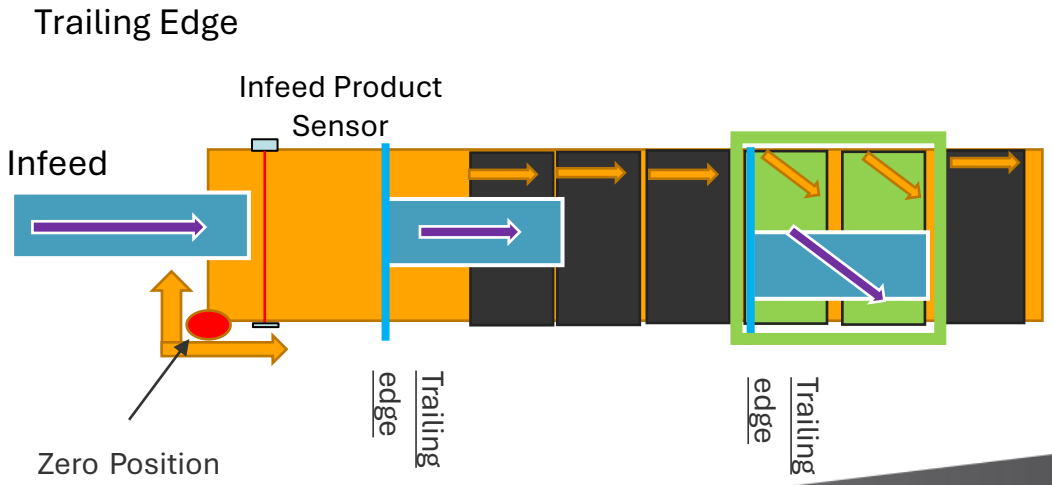
Leading edge: Activation is triggered when leading edge of the product reaches the trigger point. Possibly rotating the product.

Center: Activation is triggered when center of the product reaches the trigger point. Possibly rotating the product.

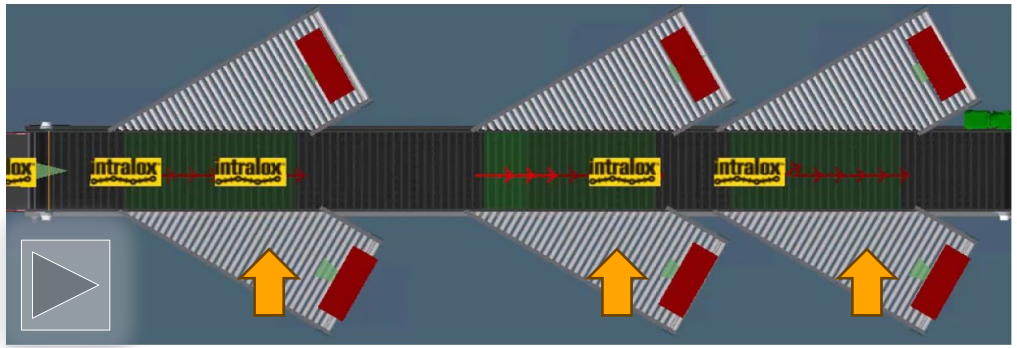
Trailing edge: Activation is triggered when trailing edge of the product reaches the trigger point. Without rotating the product







S70X0 sorter: Divert trigger point

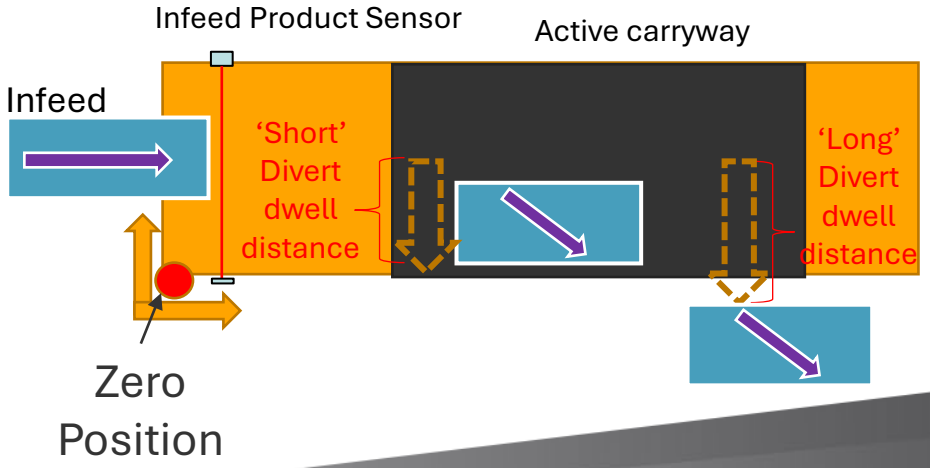


Divert trigger point: Allows to finetune the position where the product is being diverted by applying an offset to the tracking point:

- Positive offsets: will shift the divert point towards Off end.

Divert distance dwell: The ‘Divert dwell distance’ feature is designed to regulate the extent of sideway movement during activation.

Default value of divert distance dwell :
If the value is left by ‘0’, the divert distance dwell will use a default value. The default value is an IDL-C calculation value.

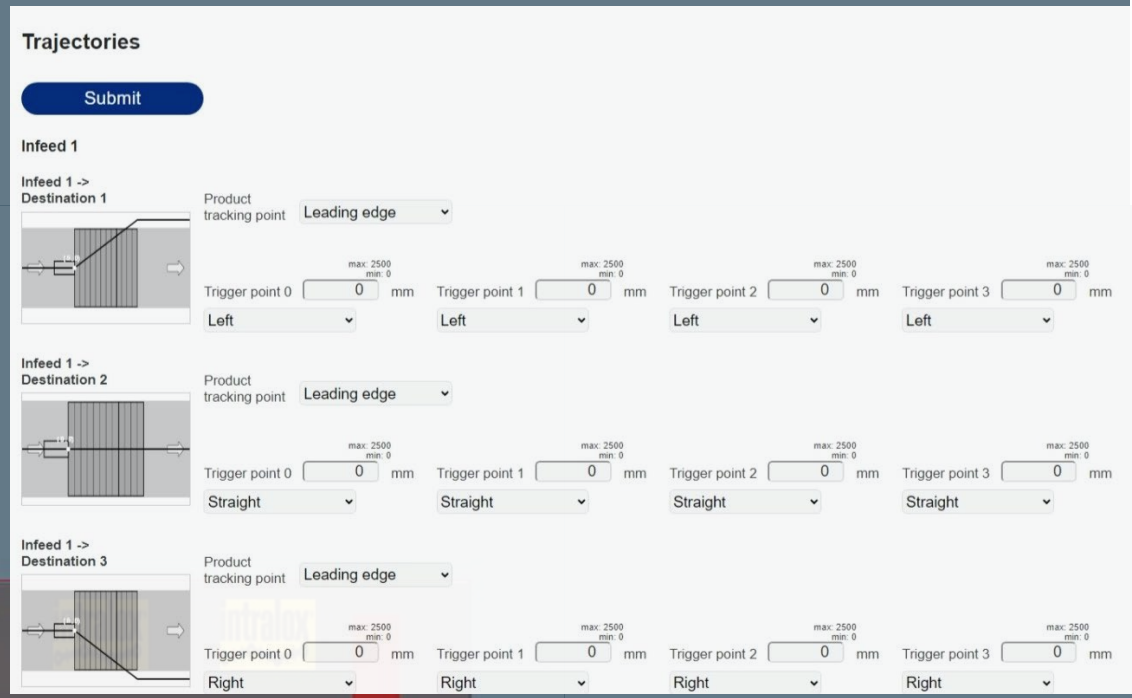


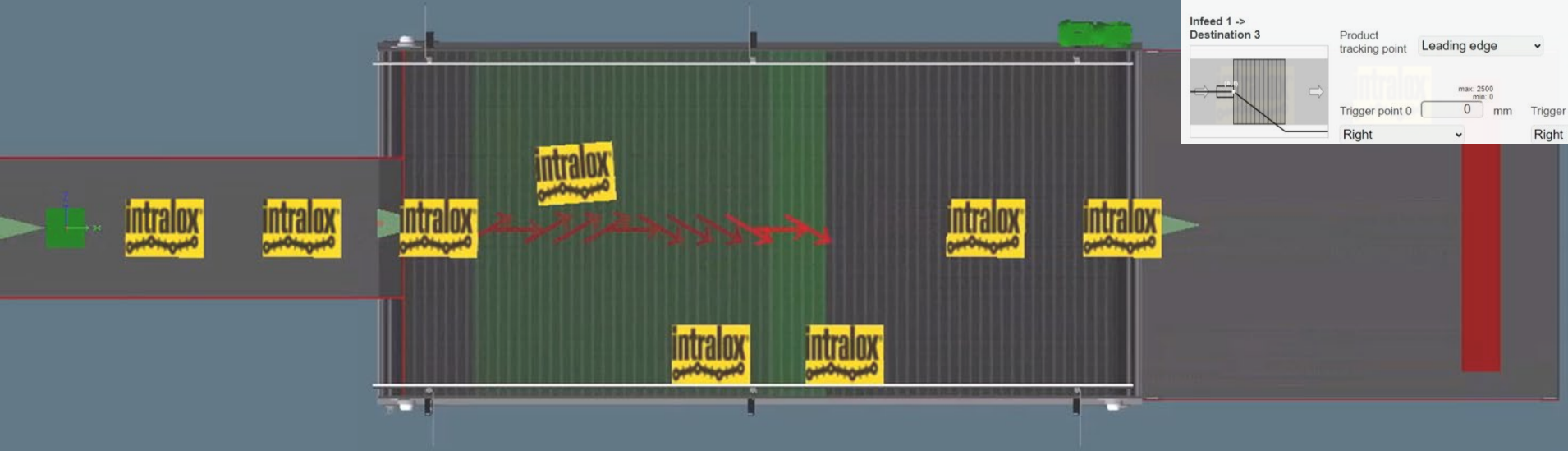
S70X0 Switches:

Fine tune the divert by Trajectories

A Trajectory defines the product path on the belt.
For S70X0 switches, it is possible to configure a unique trajectory for each destination.

Within each trajectory, it is possible to create up to four different direction change points, also known as Trigger Points.





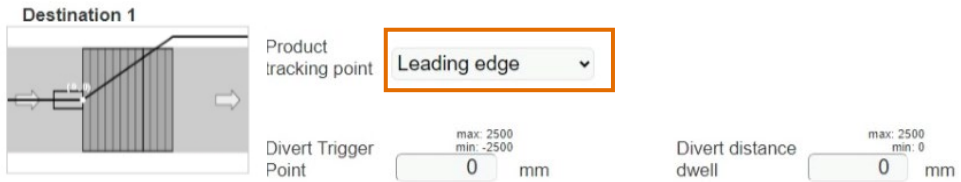
S70X0 swtich: Product tracking point

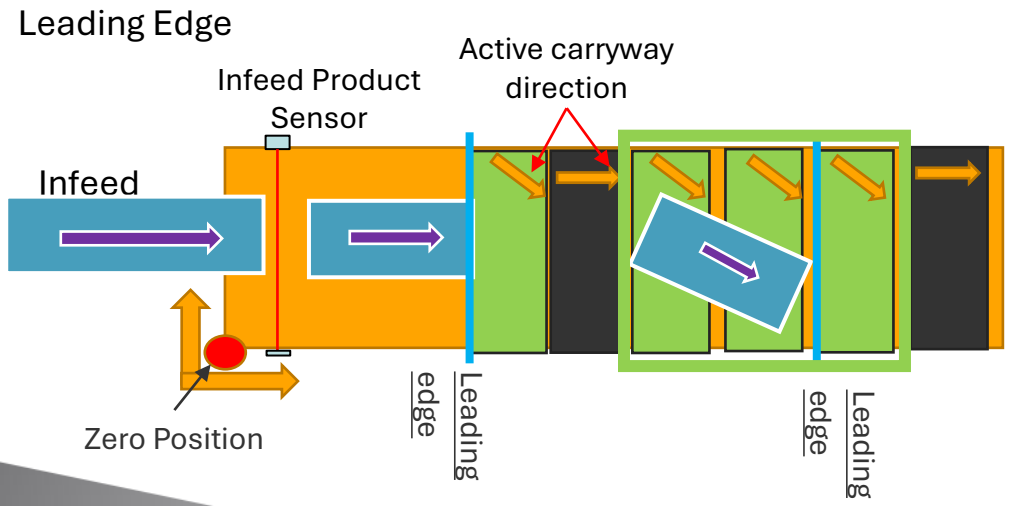
What is leading edge, center and trailing edge?

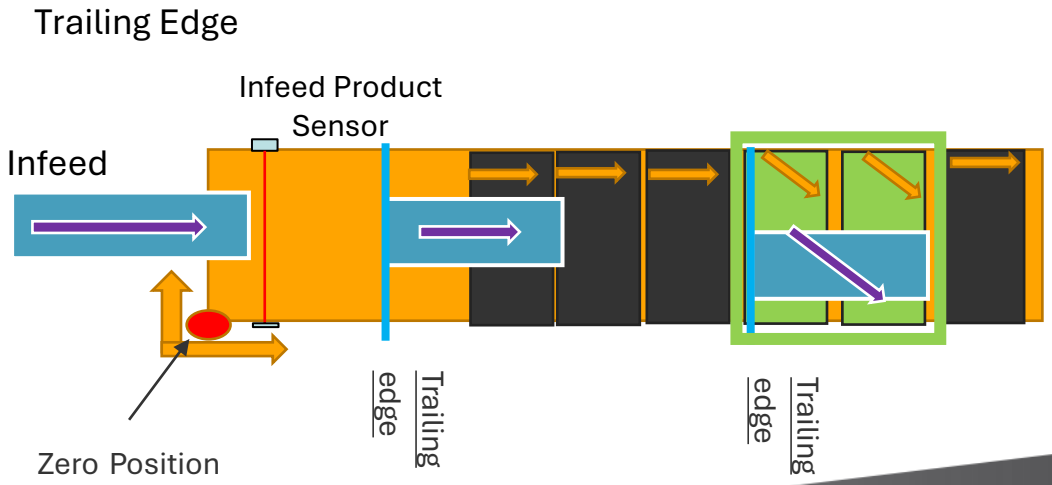
Leading edge: Activation is triggered when leading edge of the product reaches the trigger point. Possibly rotating the product.

Center: Activation is triggered when center of the product reaches the trigger point. Possibly rotating the product.

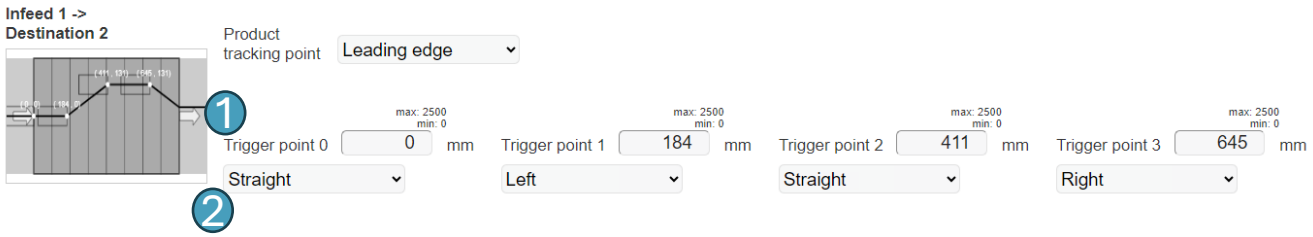
Trailing edge: Activation is triggered when trailing edge of the product reaches the trigger point. Without rotating the product

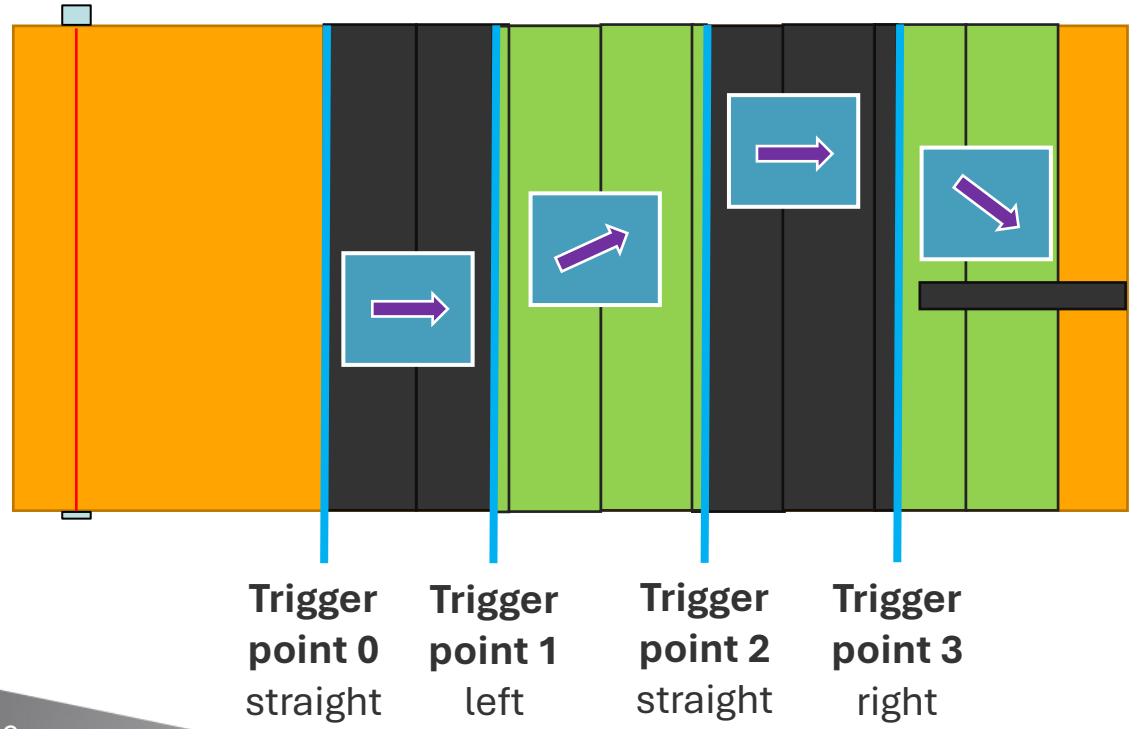






S70X0 Switches: trigger points





Trigger point:
Trigger Point is a is a point to change the direction of activation. Each trigger point is defined by the following parameters:

1. Distance: distance from the start of the active carryway to the trigger point. This parameter determines when the activation direction of the active carryway should change.

2. Direction: Activation direction of the active carryway. This parameter sets the direction of activation for the active carryway. The options vary depending on the type of belt:

For Bidirectional Belts, the activation direction can be set to Left, Straight, or Right.

For Unidirectional Belts, the activation direction can be set to Left/Right, or Straight.

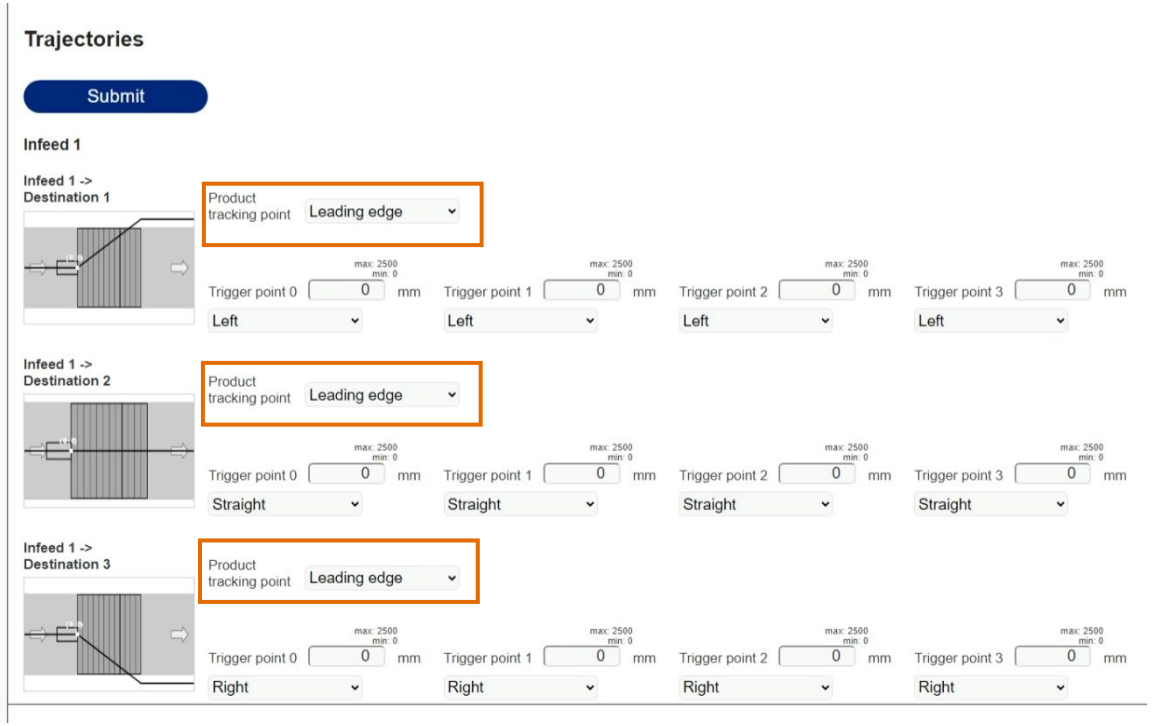
To a S70X0 switch application, the trajectories features allows the user to have maximum to 4 trigger points settings. With this fuction the users can create a complex pathway.

Notes:
If a system uses fewer than four trigger points, any additional points should be set to the same values as the last used point.

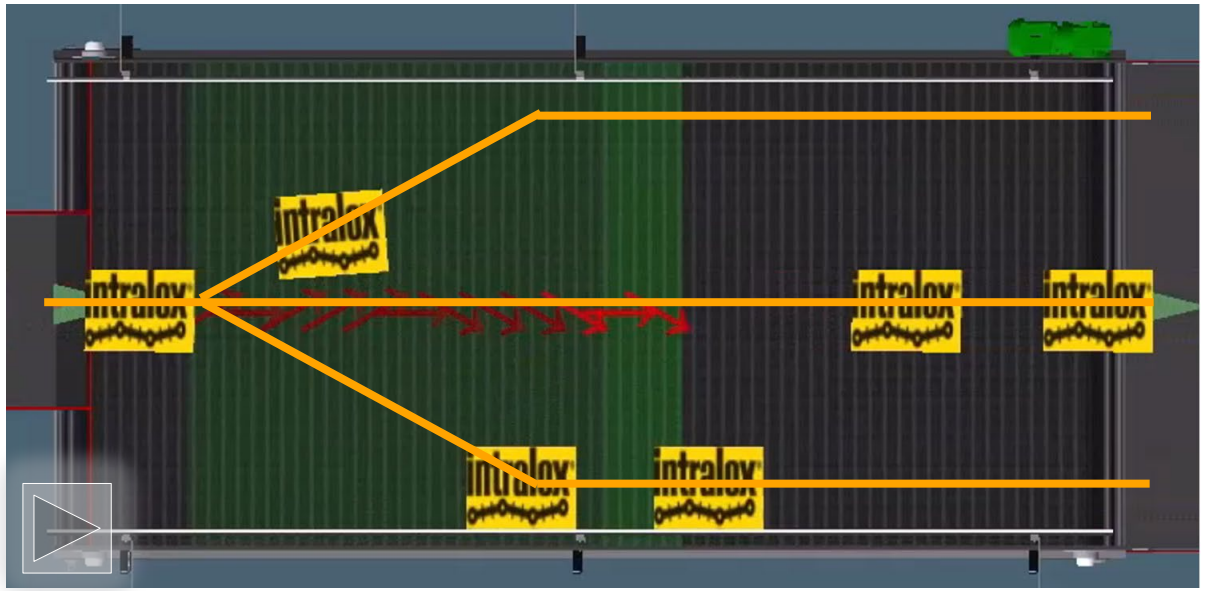
S70X0 Switches: a simple trajectory example

Leading edge mode:

Under the leading-edge mode, the product will orientate itself to the leading direction. For example, if the product switch to the left side, the product will orientate itself to left.



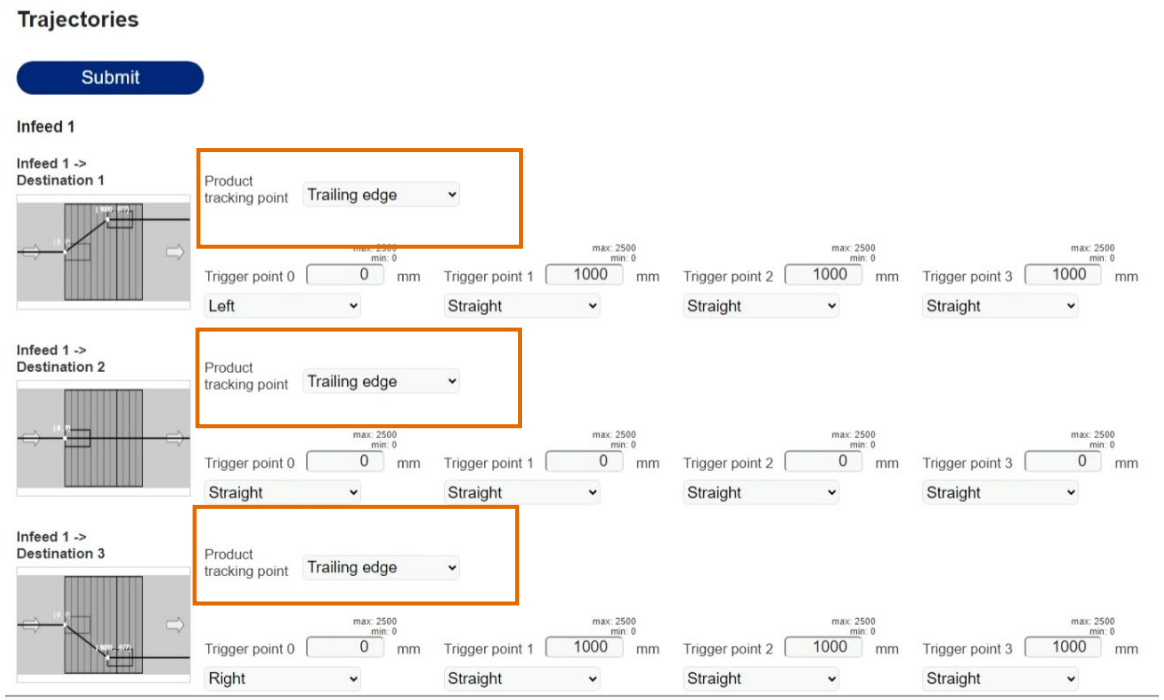
Leading edge mode : Side rails align

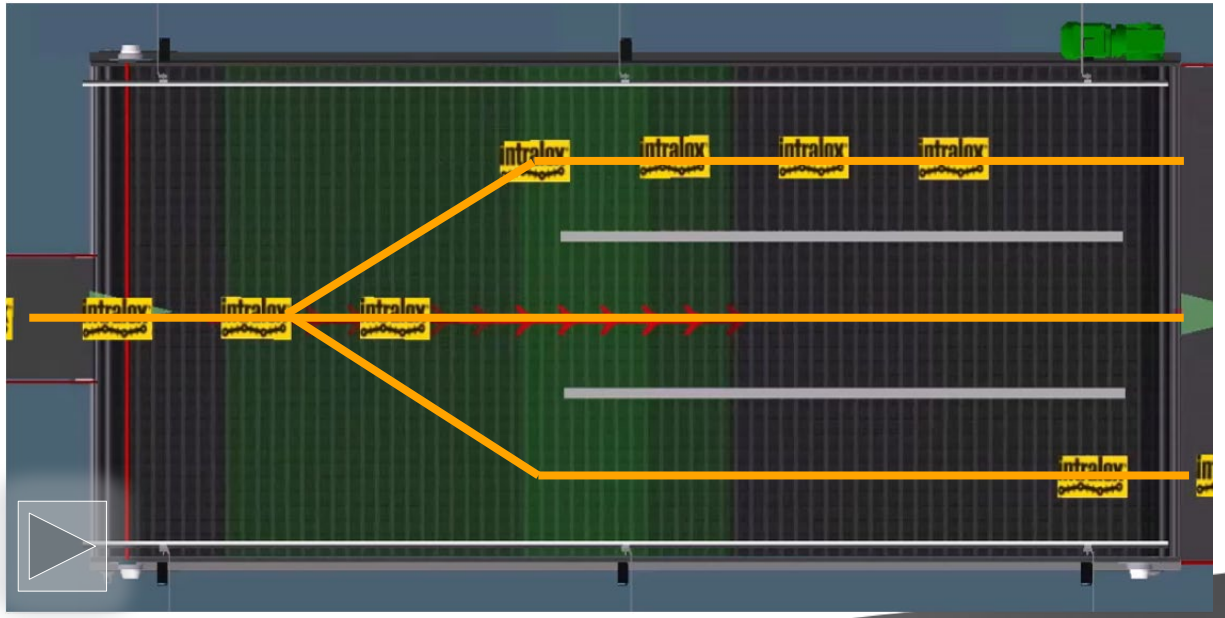


S70X0 Switches: a simple trajectory example

Trailing edge mode

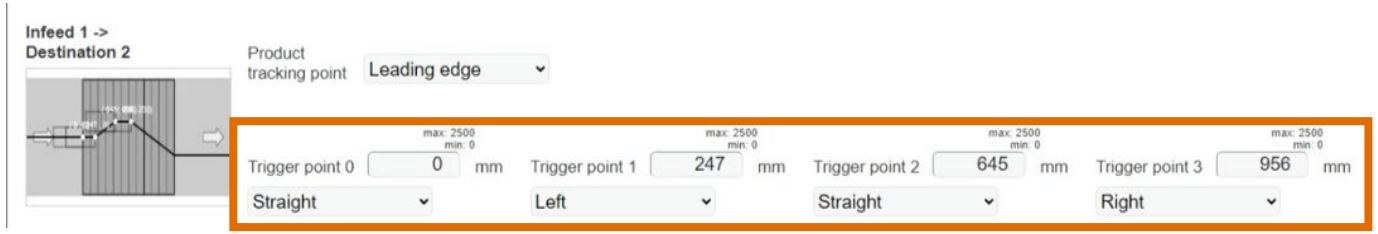
Under the trailing edge mode, the product's orientation will be retained.

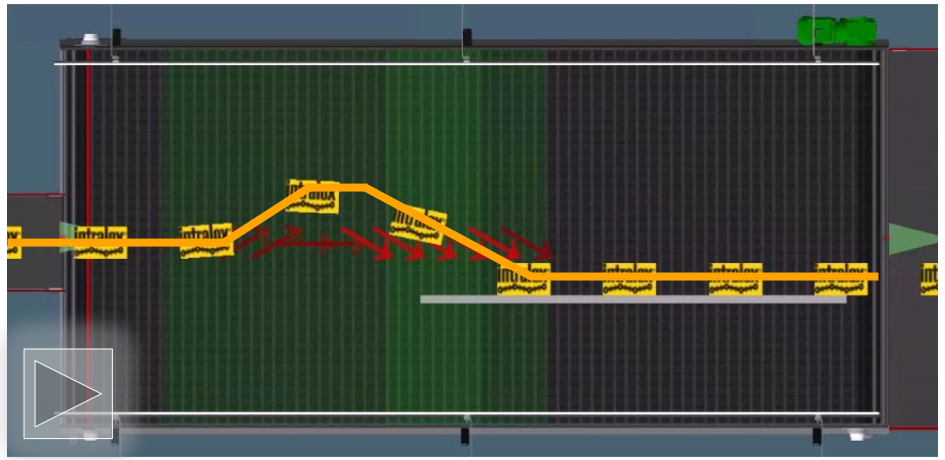




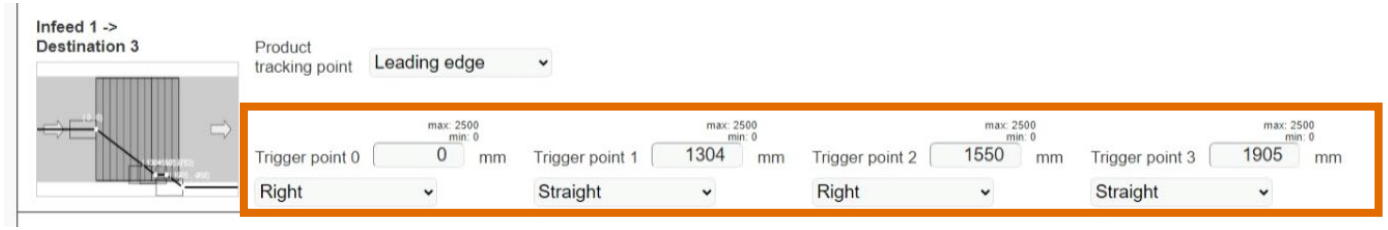
Trajectories – S70X0 Switches
Complex trajectory example

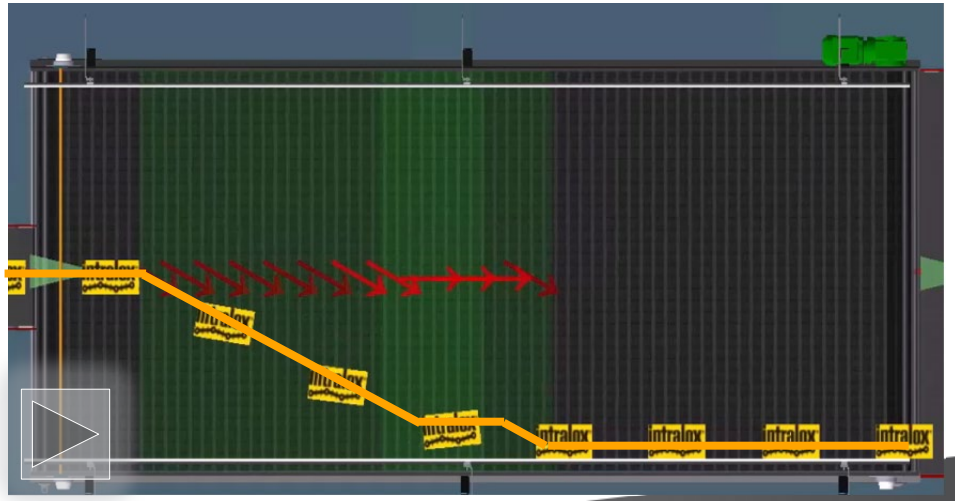
- Center rail align





- Soft side rails align





Recipes

What is recipes by ISC?

Recipe contains all the trajectory data. The ISC CAM allows for the storage of up to eight recipes. When changing settings on the trajectories and pressing submit button, values are automatically saved to the currently active recipe.

How to activate a recipe?

A recipe can be activated by switching the active recipe on the Settings page.
Please note that active recipe should only be switched when there are no products on the belt.
Active recipe can't be switched while settings are being saved.

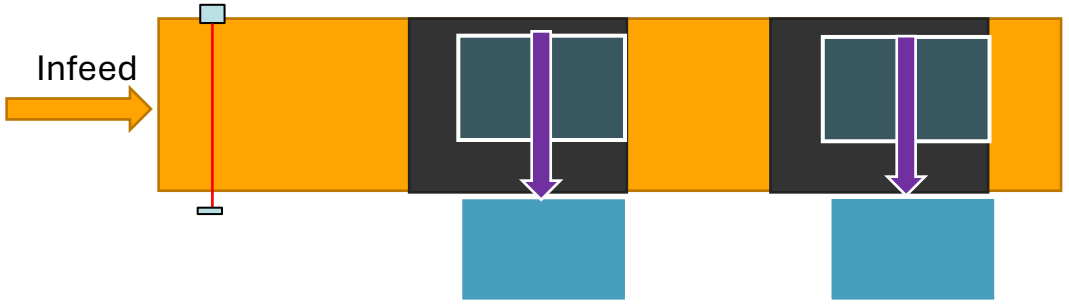
How to edit the recipes in ISC CAM?

Editing is restricted to active recipe. To edit a recipe, it needs to be selected to be the active recipe. Trajectory data can then be changed and saved. While saving, the correct data is also saved to the recipe.

Recipe example for DARB

Recipes can be used for example for different product sizes. For instance, when dealing with smaller products, the Divert Distance Dwell can be adjusted to a lower value. This allows for a shorter activation period, optimizing the conveyor system's efficiency for smaller items.

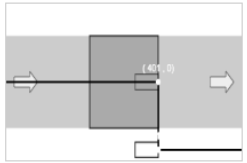
Recipe 0 – bigger product, longer activation



Recipes

Active recipe 0

Destination 1

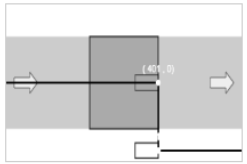


Product tracking point: Leading edge

Divert Trigger Point: 0 mm (max: 2500, min: -2500)

Divert distance dwell: 298 mm (max: 2500, min: 0)

Destination 2

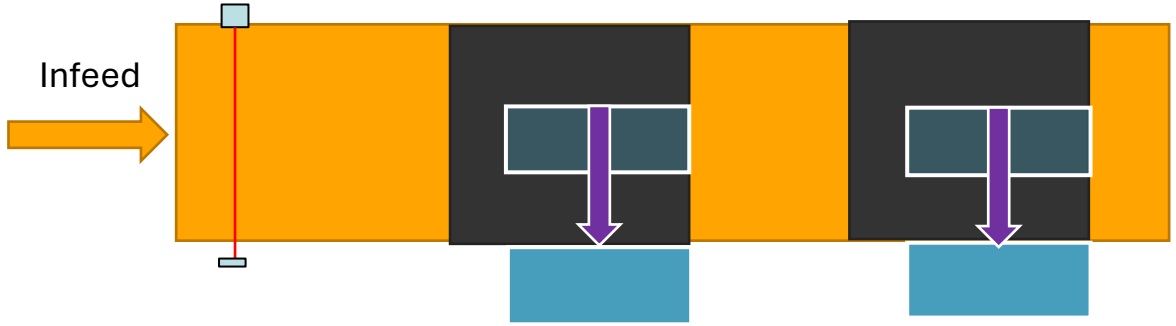


Product tracking point: Leading edge

Divert Trigger Point: 0 mm (max: 2500, min: -2500)

Divert distance dwell: 298 mm (max: 2500, min: 0)

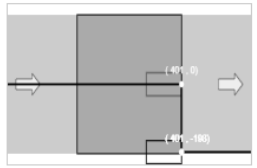
Recipe 1 – smaller product, shorter activation



Recipes

Active recipe 1

Destination 1

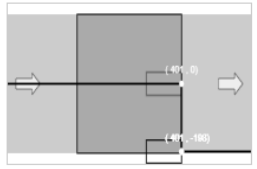


Product tracking point: Leading edge

Divert Trigger Point: 0 mm (max: 2500, min: -2500)

Divert distance dwell: 198 mm (max: 2500, min: 0)

Destination 2



Product tracking point: Leading edge

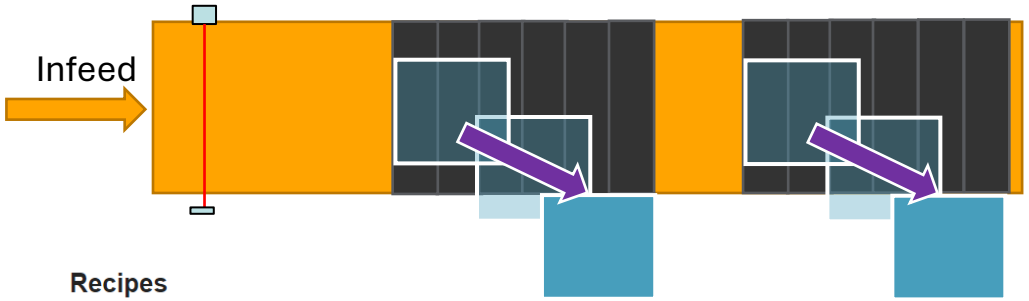
Divert Trigger Point: 0 mm (max: 2500, min: -2500)

Divert distance dwell: 198 mm (max: 2500, min: 0)

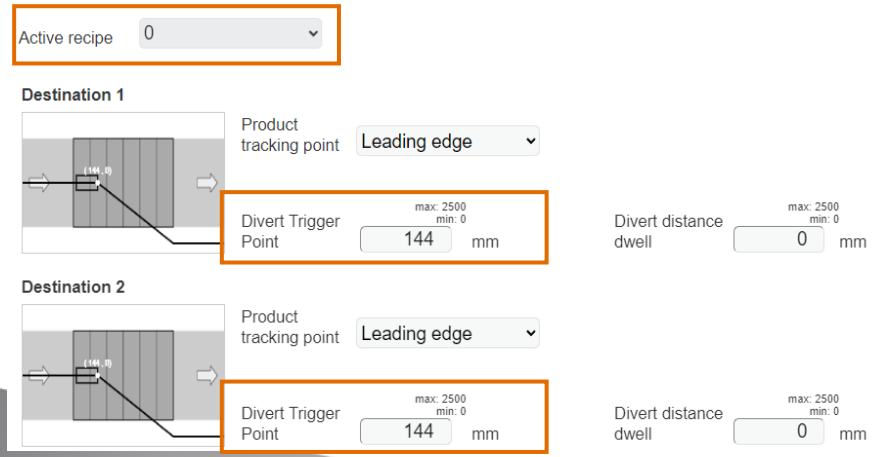
Recipe example for S70X0 sorters

Recipes can be used for example for different product sizes. For instance, when dealing with smaller products, the Divert trigger point position can be set to bigger values. This allows later activation, optimizing the conveyor system's efficiency for smaller items.

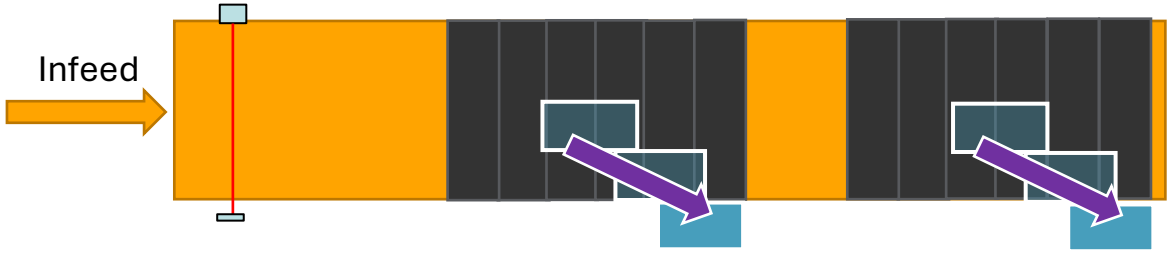
Recipe 0 – bigger product, earlier activation



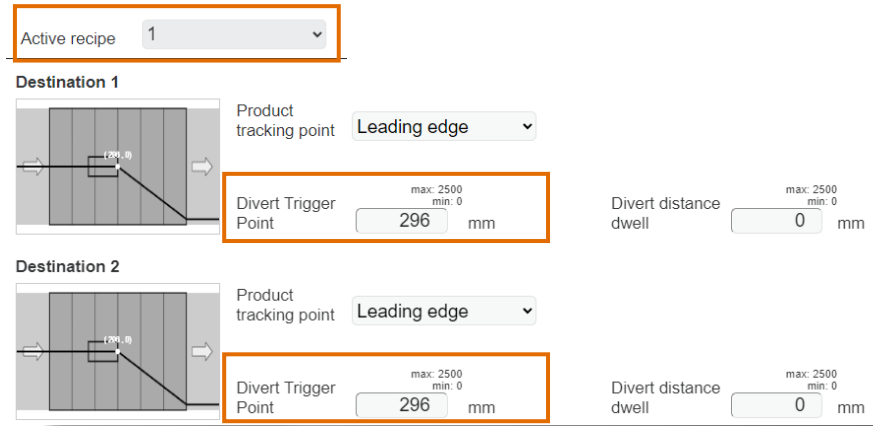
Recipes



Recipe 1 – smaller product, later activation



Recipes



Advanced

Equipment settings and application data settings

Equipment settings:

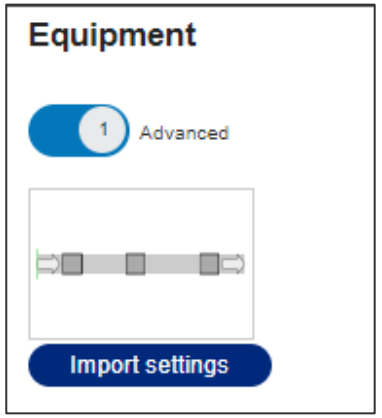
Before starting with the equipment, you must verify that the data in the Equipment page matches the equipment supplied.

All the parameters in the equipment are the physical setup of the Intralox equipment. They are necessary data to start with ISC.

In case it is necessary to import settings, the "Import settings" button can be found on the "Equipment" page, only when advanced options are visible.

See ISC CAM replacement instruction.

Always refer to the system’s documentation or consult an Intralox expert for precise information.



Application data :

This data refers to all the setting data under the 'Setting page'. While in advanced mode, with the button "Export Settings" and "Import Settings", the ISC allows the users to create a backup file of all the settings data, and also restore old settings by importing a settings file. This function can be practically implemented during commissioning and replacement of ISC.

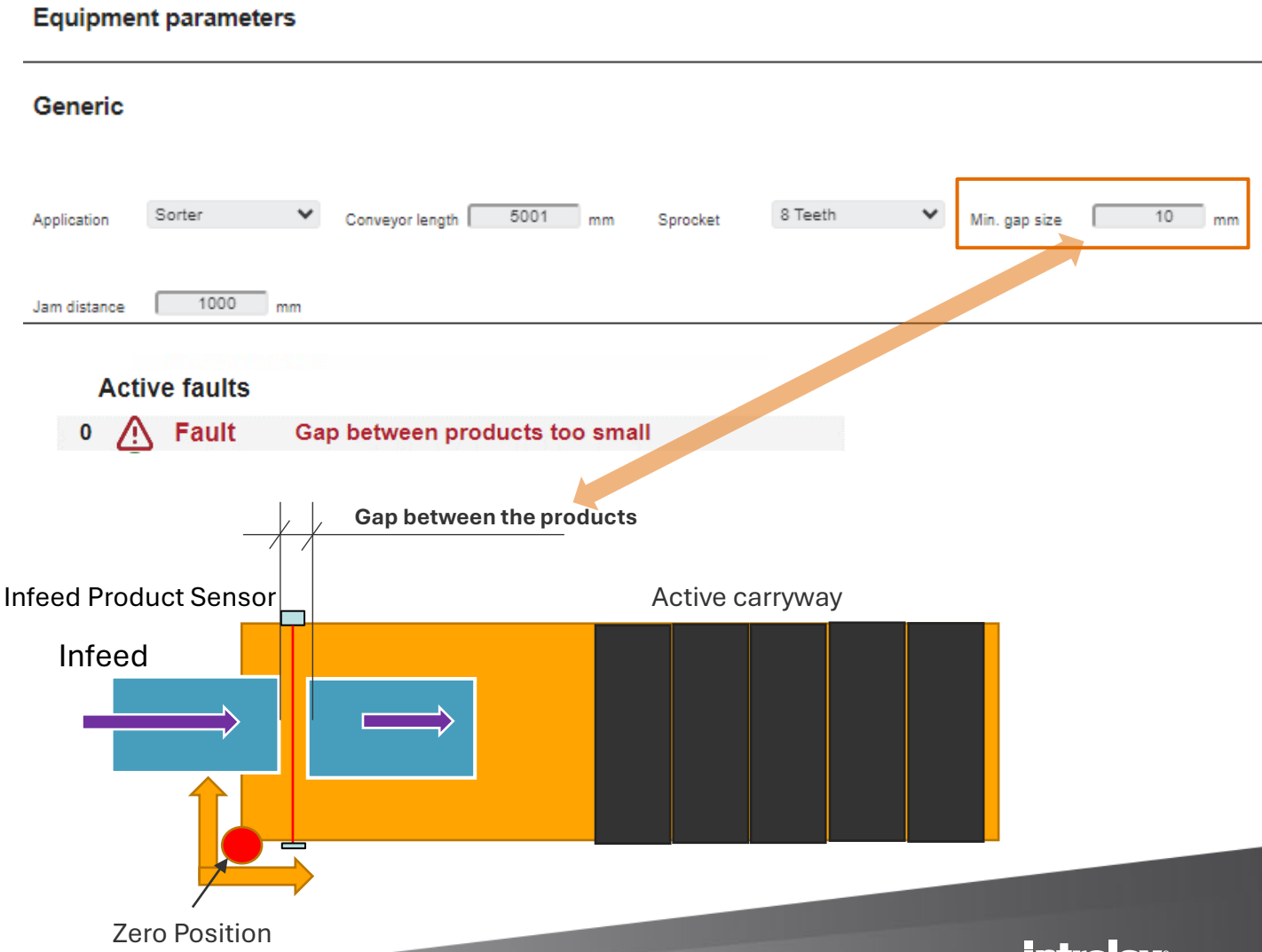
The exported files are with ‘.apl’ extension.

Gap too small fault

This fault condition arises when the distance between two products, as measured, is smaller than the minimum gap necessary for a successful product diversion. Intralox sets this minimum gap as a constant value during the assembly and testing phase of the equipment.

The value of the minimum gap is in the virtual Human-Machine Interface (vHMI) on the equipment page, under the ‘Generic’ section, labeled as ‘Min. gap size’. It is important to note that the minimum gap is influenced by several factors, not limited to the belt speed, the angle of trajectory, and the size of the product. These factors are taken into account when determining the gap size.

When the detected gap is too small between the products, there will be a fault generated on the Fault page.



Gap too small fault

What will be resulted from a gap too small fault?

A too small gap is a fault condition that can cause jams or products not reaching their intended destination, therefore this should normally not occur during operation.

Corrective actions

1. Increase the gap between products by lowering the rate products are introduced,
2. Increase the belt speed.

Reset of the Gap too small fault

Automatic reset

Once the infeed PE detects a product with a sufficiently large gap, the fault resets. As the gap check occurs the moment the front edge of a product is detected, the fault will remain active until a product with a sufficiently large gap has entered the equipment. It will not automatically reset when the gap behind the last product has been found sufficient.

Manual reset

1. Pressing Reset button on the vHMI on the fault page
2. Via the PLC by sending reset command, see ISC CAM network communication data interface..

Gap too small action

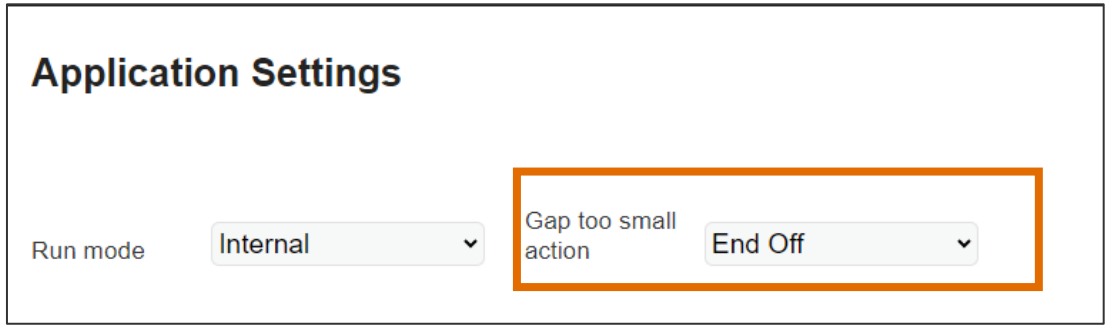
The ISC CAM IDL-C-2.0.0 has several options aimed at attempting to minimize the negative impact from a too small gap*.
The following recovery mechanism are available:

End off**
When a too small gap is detected, the ISC CAM will attempt to send the product that is too close to the previous product to the end off destination**

Attempt to divert
When a too small gap is detected, the ISC CAM will attempt to send the product that is too close to the previous product towards its assigned destination**. The system attempts to divert the product, though success may vary based on product size, weight, and conveyor load and speed.

Follow previous
When a too small gap is detected, the ISC CAM will send the product that is too close to the previous product to the same destination as the previous product. The system allows the following product to continue along the same path as the previous product, useful for identical products or non-dependent destinations.

Gap too small action on settings page

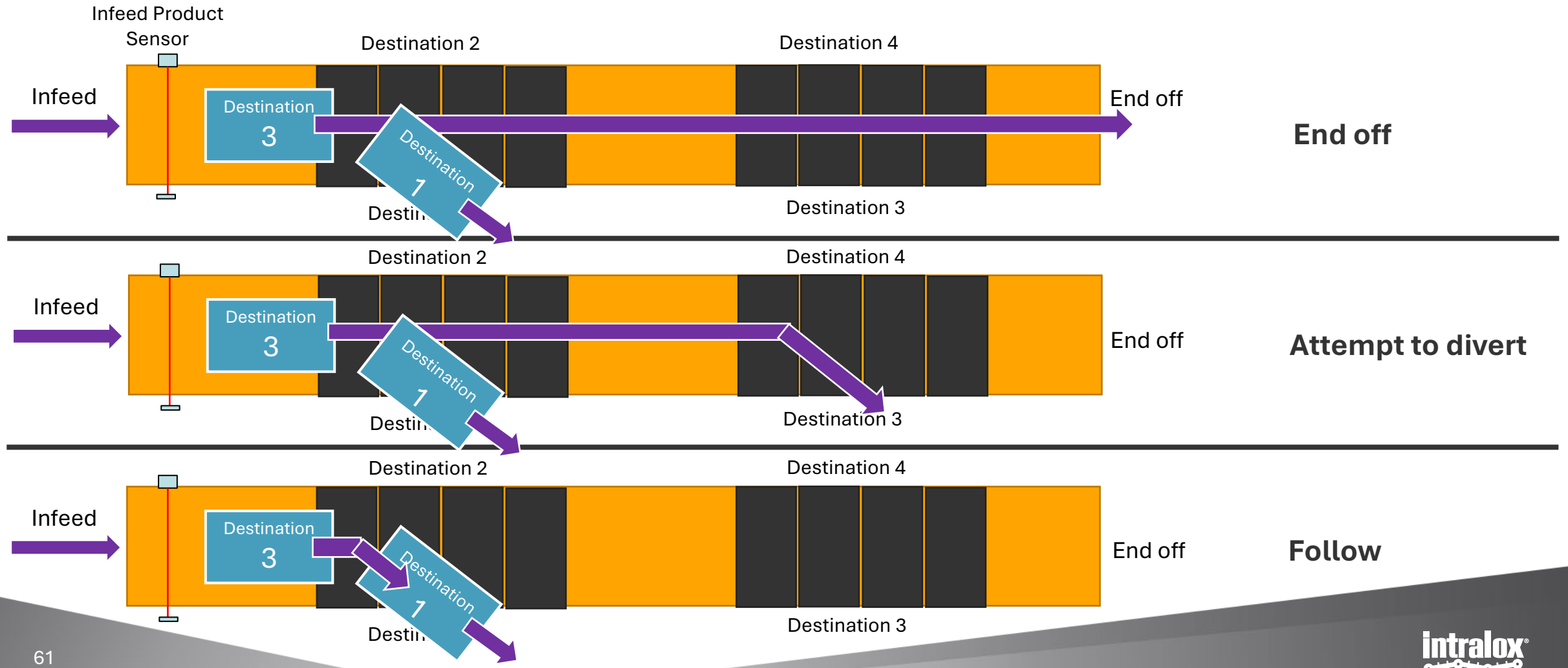


Gap Too Small Action: This action is triggered when the gap between two products on the conveyor is insufficient, potentially causing collisions or jams.

These actions ensure smooth conveyor operation and prevent issues from closely spaced products. Always refer to the system's documentation or consult an Intralox expert for precise information.

Note:
* Successful Gap too small recovery can not be guaranteed and may result in a Jam or incorrectly diverted products.
** Not available for switches

Gap too small action example



Debounce distance

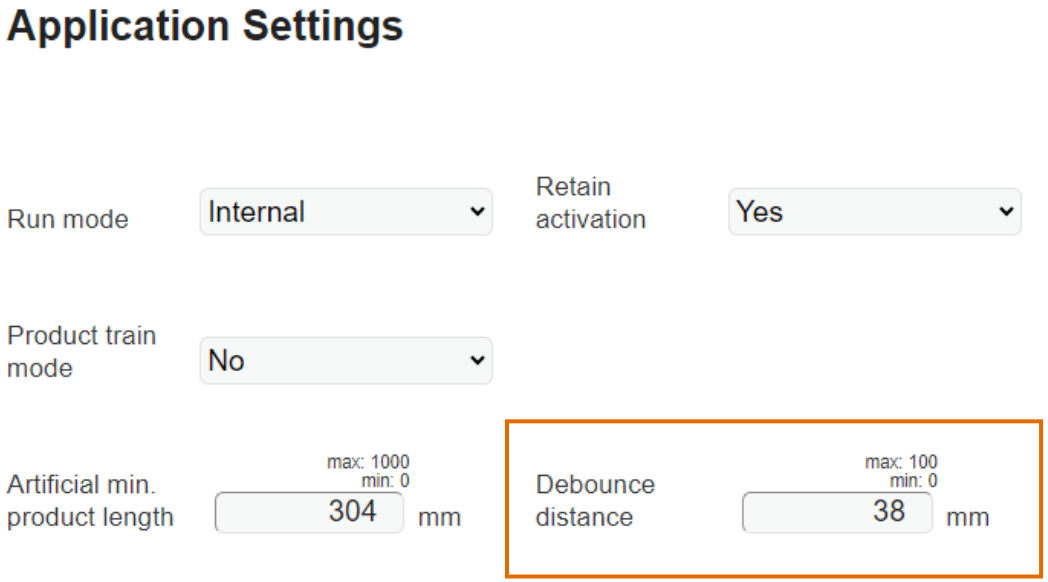
The Debounce Distance feature is a filter applied to the photo eye sensor. This feature ensures that the photo eye sensor only triggers for products that are longer than the specified debounce distance.

Acting as an Infeed photo eye (PE) filter, it effectively ignores any product features that are shorter than the set debounce distance. This allows for the removal of product artifacts that should not contribute to the triggering of the sensor. Examples of such artifacts include open flaps, loose packing tape, and more.

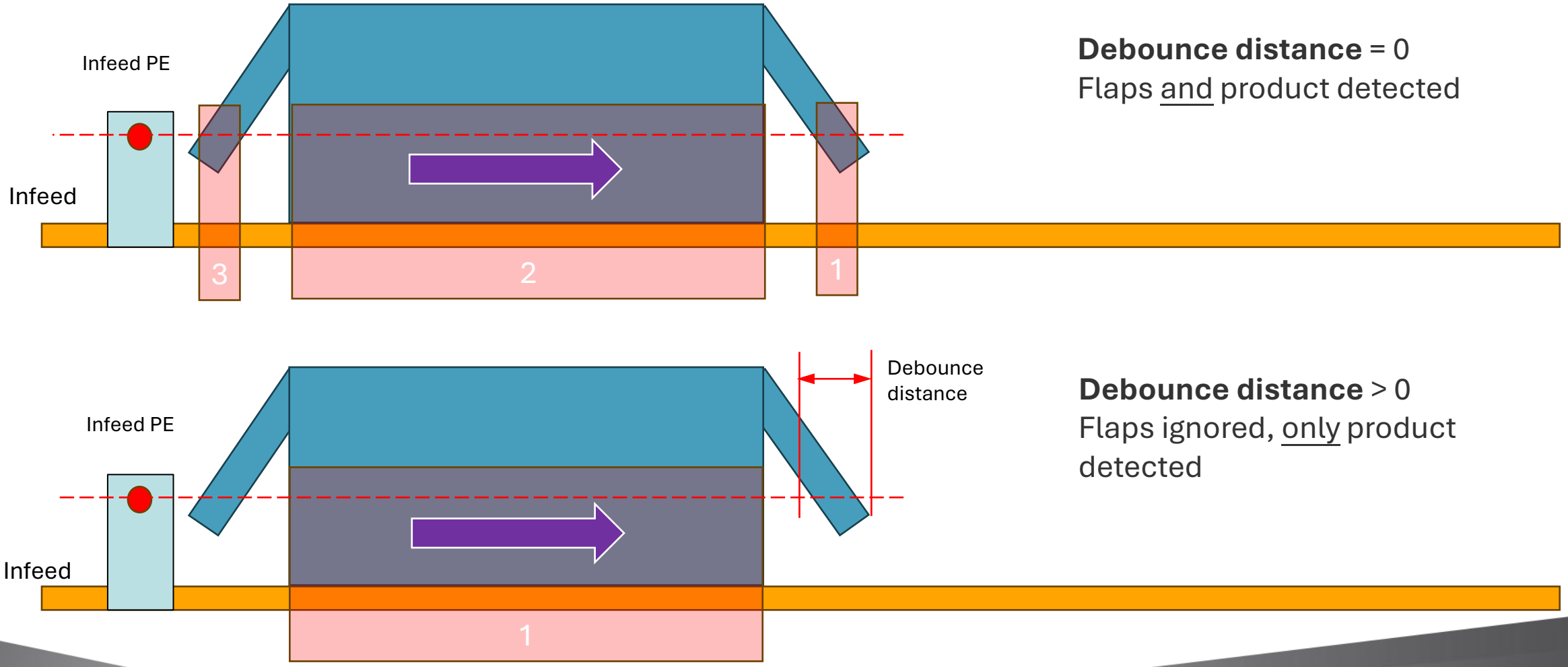
It is important to note some advanced considerations. Large settings for the debounce distance may result in late divert activation under certain conditions. These conditions include but are not limited to, when the distance between the infeed PE and the active carryway is less than 150mm, the belt speed exceeds 40m/min, and specific modes such as AIM, S70x0 Leading edge mode, and DARB trailing edge mode are in operation.

In summary, the Debounce Distance feature is a critical component in ensuring accurate and efficient operation of the photo eye sensor by filtering out unnecessary triggers and focusing on the relevant product features.

Debounce distance on settings page



Debounce distance setting example



Debounce distance = 0
Flaps and product detected

Debounce distance > 0
Flaps ignored, only product detected

Artificial min. product length

What is artificial minimum product length?

The Artificial min. product length feature allows user to artificially define minimum product length. The value of the artificial min. product length will be assigned to the ISC, if the photo eye detected product length is shorter than the specified artificial product length.

Upon positive product detection by the infeed PE, the ISC CAM will set the product length to the artificial product length and ignore any infeed PE changes until the product has moved the artificial product length. Once the product has moved the artificial product length, the ISC CAM will:

- If the infeed PE is blocked, set the product length to the actual product length detected.
- If the infeed PE is unblocked, keep the artificial product length as the product length.

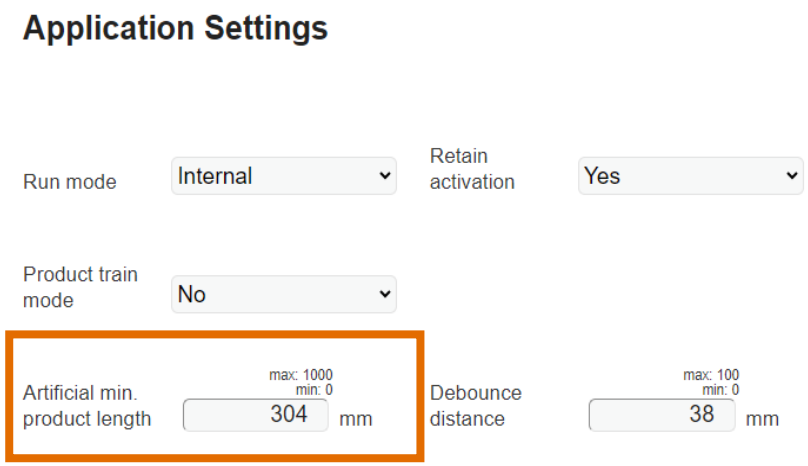
Advanced considerations include the fact that if the artificial product length is larger than the product, the actual product gap must allow for the excess product length.

In summary, the Artificial Product Length feature is a crucial component in ensuring accurate and efficient operation of the photo eye sensor by assigning an artificial length to shorter products and focusing on the relevant product features.

Use case:

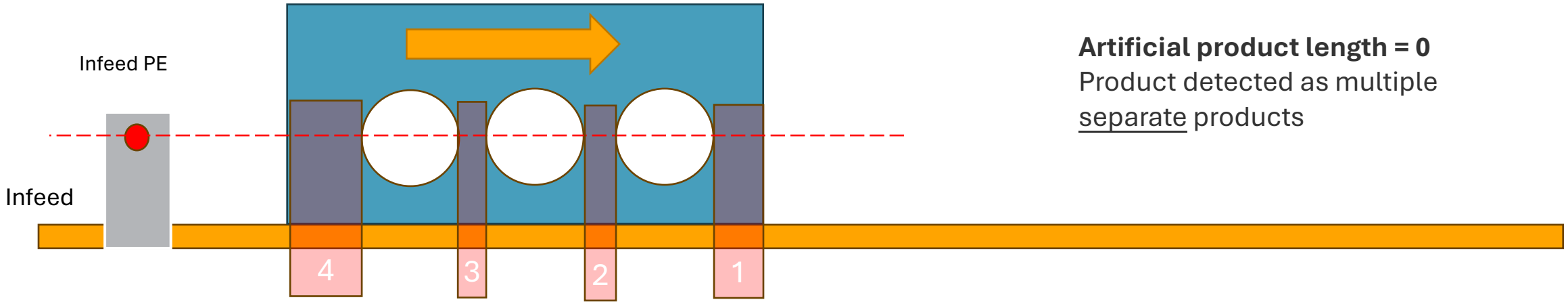
This feature is particularly useful in allowing the detection of partly transparent products such as crates, shrink-wrapped soda bottles, and more. However, it's important to note that products must have sufficient non-transparent areas at both ends for the feature to function effectively.

Artificial min. product length on settings page

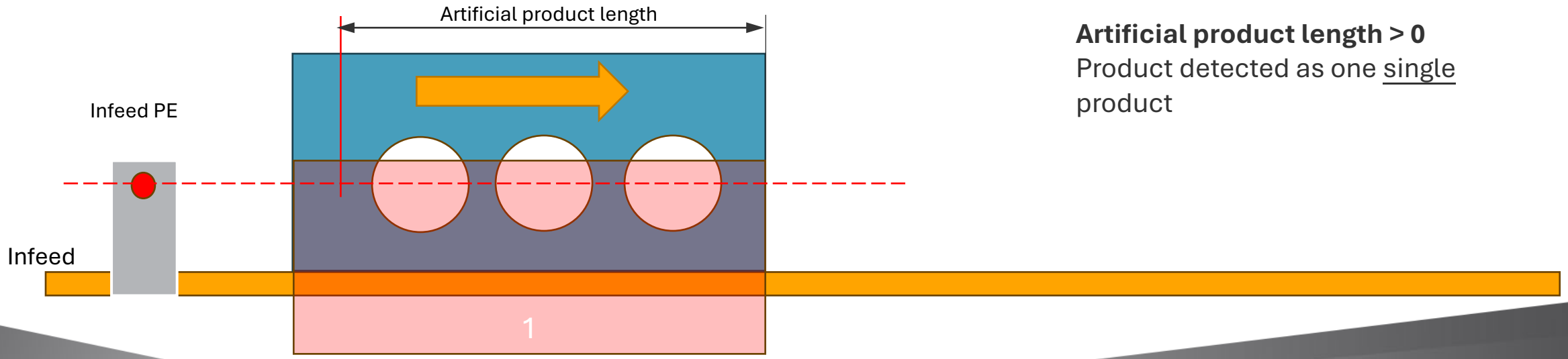


Note: the artificial min. product length is not the same setting's parameter of the minimum product length in the ISC IDL C-1.x.

Artificial distance setting example



Artificial product length = 0
Product detected as multiple separate products



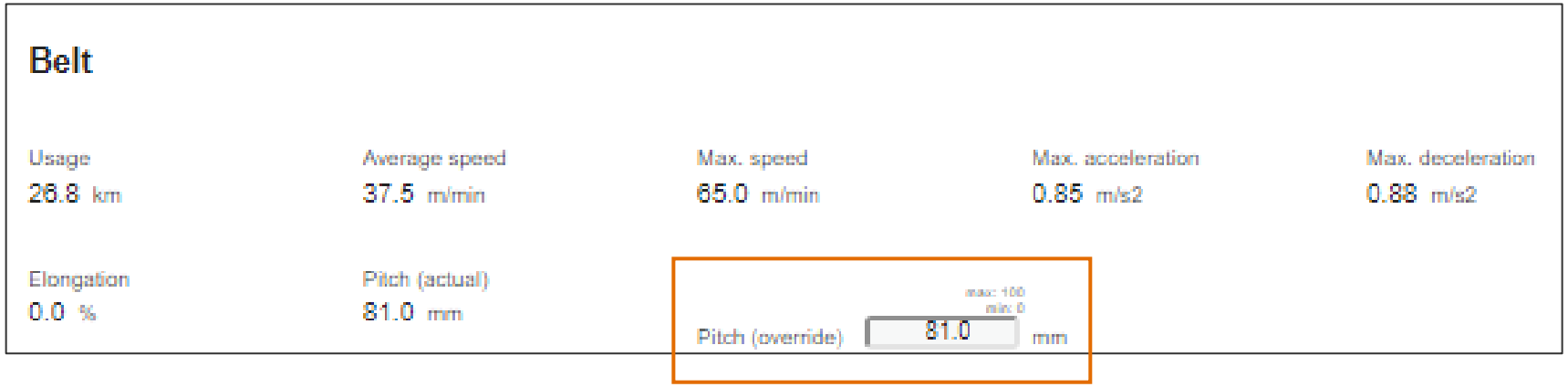
Artificial product length > 0
Product detected as one single product

Belt pitch override

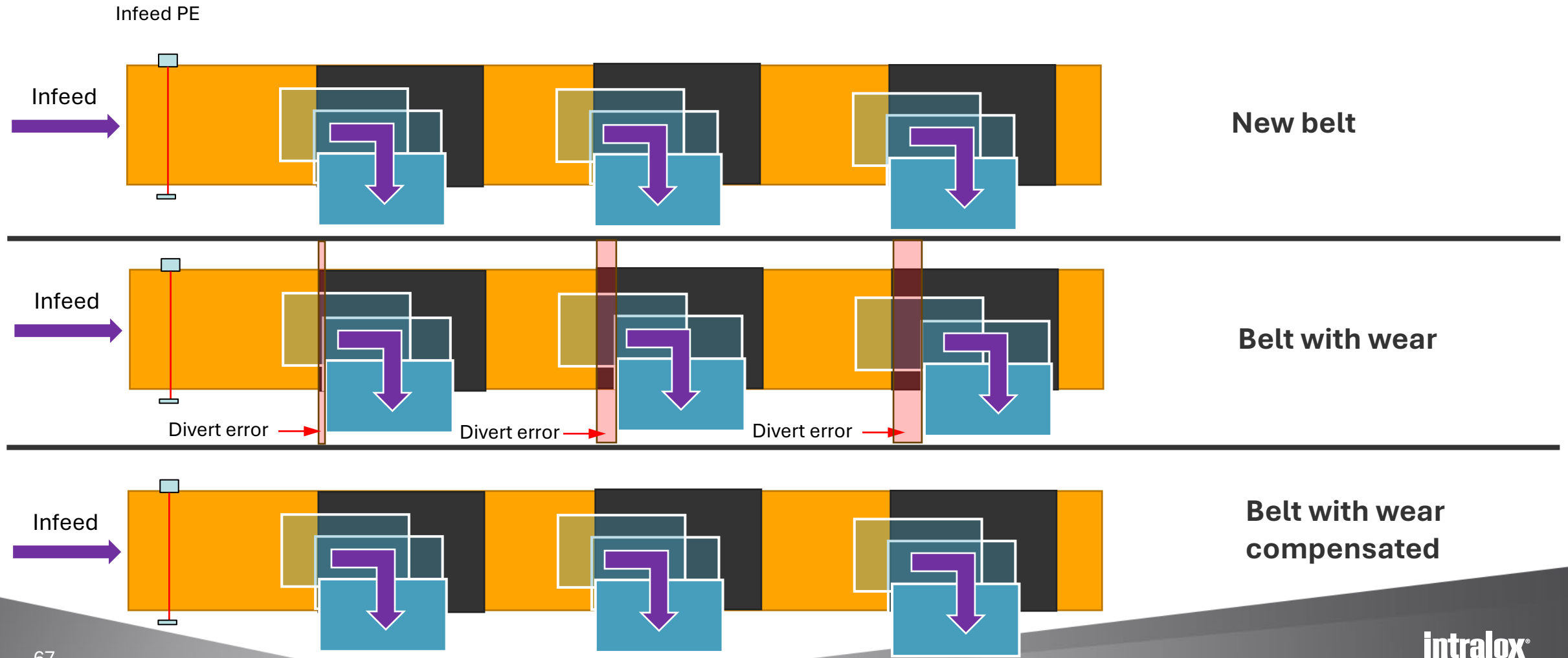
Belt pitch override is a feature that allows the ISC CAM to take into consideration any belt elongation.
In time it is normal to experience some elongation on the belt. In order to compensate this and still have proper activation, it is important to use the belt pitch override value to match the actual pitch of the belt.

For more detail on measuring belt elongation : How-To Videos | Intralox

Belt pitch override on maintenance page



Belt pitch correction example



Valve Override

What is valve override function?

During normal operation, the ISC CAM IDL-C relies on an Infeed PE signal to energize the valve(s) and activate the active carryway.

Valve override function allows the user to manually activate the valve without external signals. When “valve override” is enabled, the valve is no longer controlled by the logic of the ISC CAM IDL-C. This toggle switch is equivalent to manually energize the valve by twisting the screw.

Typical Applications of “Valve Override”

This feature is intended for non-production scenarios, such as maintenance and troubleshooting. It allows operators to verify the proper functioning of the active carryway components.

How to set the valve override by DARB or AIM technology?

Each active carryway can be activated separately.

Step 1: toggle “enable override”:

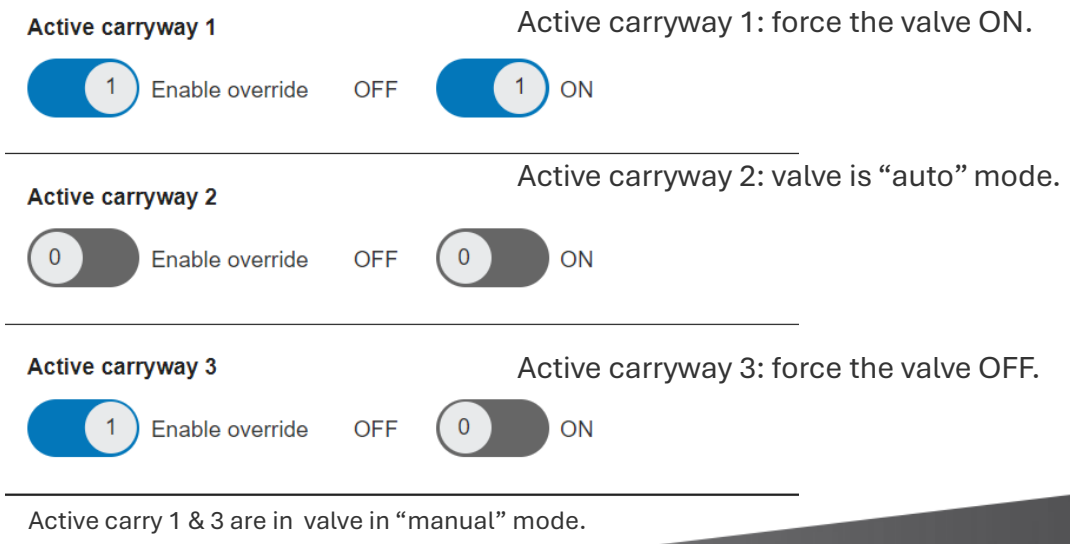
- 0: valve is controlled by the ISC CAM IDL-C upon inputs signal;
- 1: valve is disconnected from ISC CAM IDL-C

Step 2: toggle “OFF/ON” (equivalent to screw in the valve)

- OFF: valve is not energized.
- ON: valve is energized.

Note: Advanced users can also utilize this function in conjunction with the PLC during startup phases, cleaning processes, or other transient states of the production line. For further details, please reach out to Intralox.

Example of valve override by DARB or AIM technology:



Valve Override

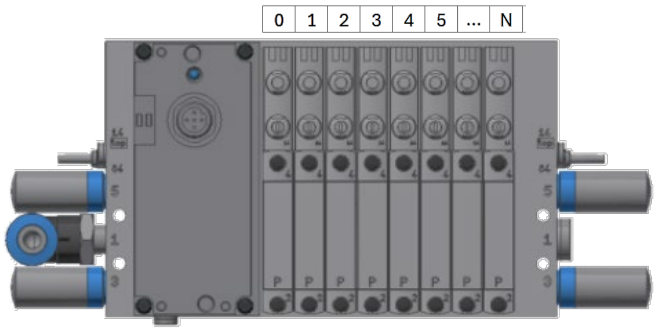
How to set the valve override S70X0 Technology?

Step 1: toggle “enable override”

0: valve is controlled by the ISC CAM IDL-C upon inputs signals

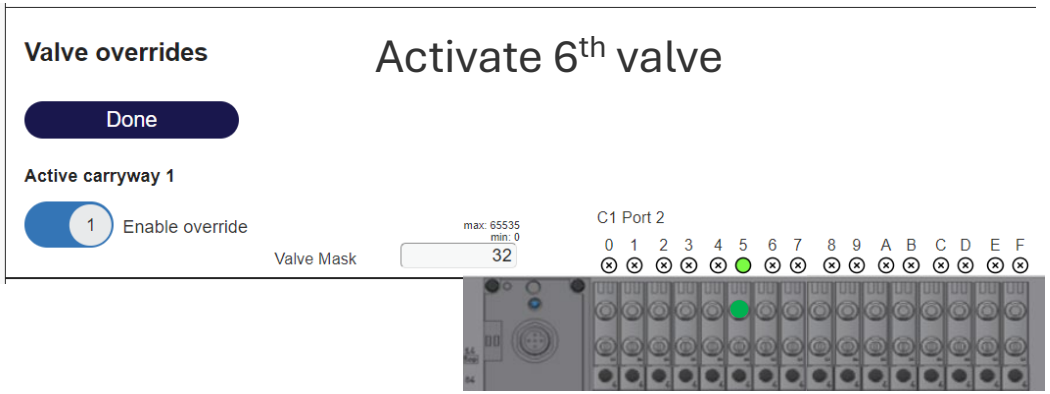
1: valve is disconnected from ISC CAM IDL-C

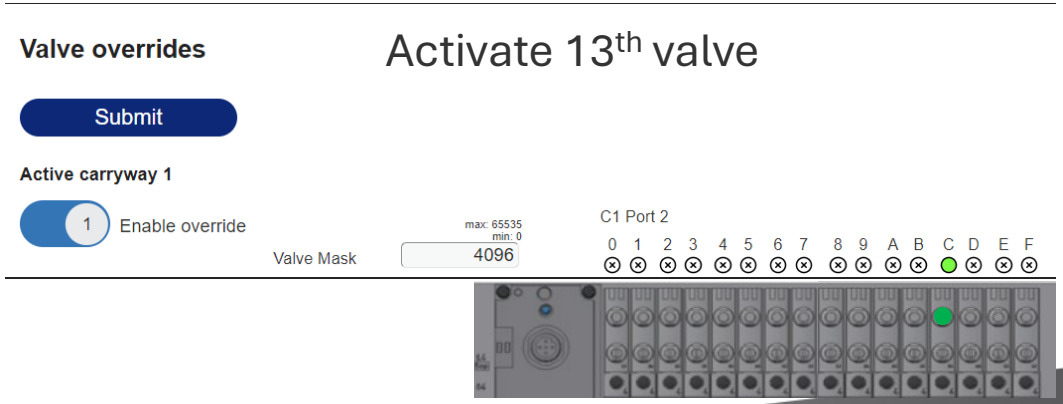
Step 2: valve mask is a binary integer representing the state of each valve. Use table below do define valve mask number.



Valve bank LED	vHMI	Valve Mask Number
0	0	1
1	1	2
2	2	4
3	3	8
4	4	16
5	5	32
6	6	64
7	7	128
8	8	256
9	9	512
10	A	1024
11	B	2048
12	C	4096
13	D	8192
14	E	16384
15	F	32768

Examples to set a valve override by S70X0 technology:





Faults and Warnings

Fault and Warning

What is different between a fault or a warning?

Faults: Faults indicate that the ISC-CAM has detected an out-of-scope situation that requires immediate action as the correct functionality of the equipment of correct divert cannot be guaranteed. Depending on the type of fault detected, the ISC-CAM may attempt a fault recovery. Faults can be categorized into faults related to equipment failures, and faults related to application failures.

Faults thresholds cannot be modified by the user.

Warnings: Warnings indicate that the ISC-CAM has detected an out-of-scope situation or a near out-of-scope situation that need to be corrected in a timely fashion to ensure correct continued functionality of the equipment. Warnings are notifications to the user; the ISC-CAM behavior does not change when a warning is triggered.

In the IDL C-2.0.0, some warning thresholds can be modified by the user.

Here are 4 application related faults and warnings to give an example, they are:

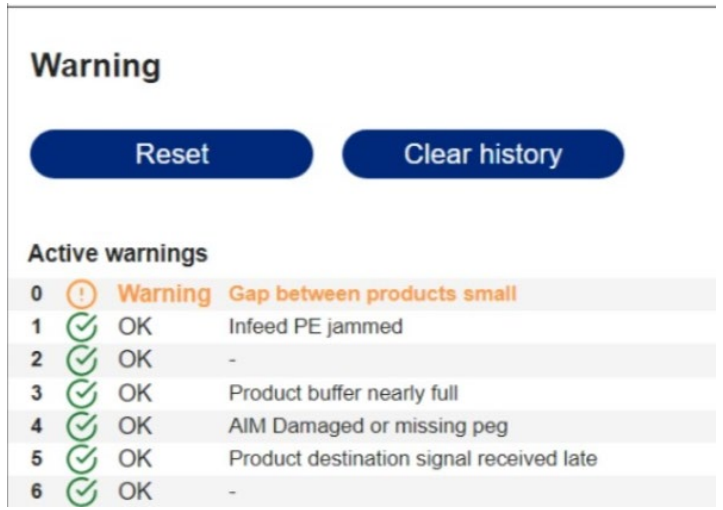
- Gap between products (too) small
- Infeed PE jammed
- Product Buffer full or nearly full
- Product destination signal received too late

About the other faults or warnings please refer to the “ISC CAM Troubleshooting guideline”.

1 Gap too small fault and warning

What is gap too small fault, what is gap small warning?

Gap too small warning: this warning arises when the distance between two products, as measured, is **close** to the minimum gap necessary for a successful product diversion. Intralox sets this minimum gap as a constant value during the assembly and testing phase of the equipment.



Corrective action

1. Increase the gap between products by lowering the rate products are introduced,
2. Increase the belt speed.

Reset of the warning

Automatic reset

Once the infeed PE detects a product with a sufficiently large gap, the warning resets. As the gap check occurs the moment the front edge of a product is detected, the warning will remain active until a product with a sufficiently large gap has entered the DPE. It will not automatically reset when the gap behind the last product has been found sufficient.

Manual reset

1. Pressing Reset button on the vHMI on the fault page
2. Via the PLC by sending reset command, see ISC CAM network communication data interface.

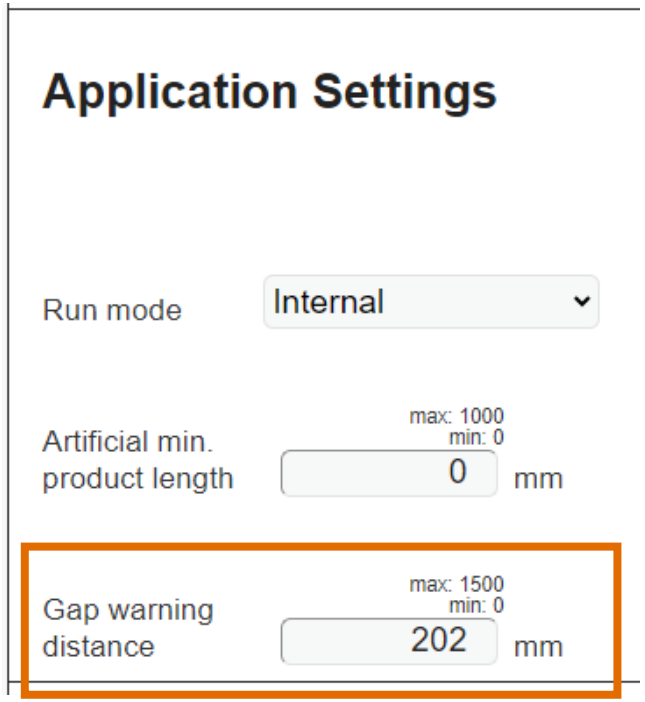
Setting of the gap warning distance

Gap Warning Distance: This parameter sets the minimum gap that needs to be between products not to trigger a warning. The minimum gap is influenced by product size and shape, conveyor speed, and downstream process requirements.

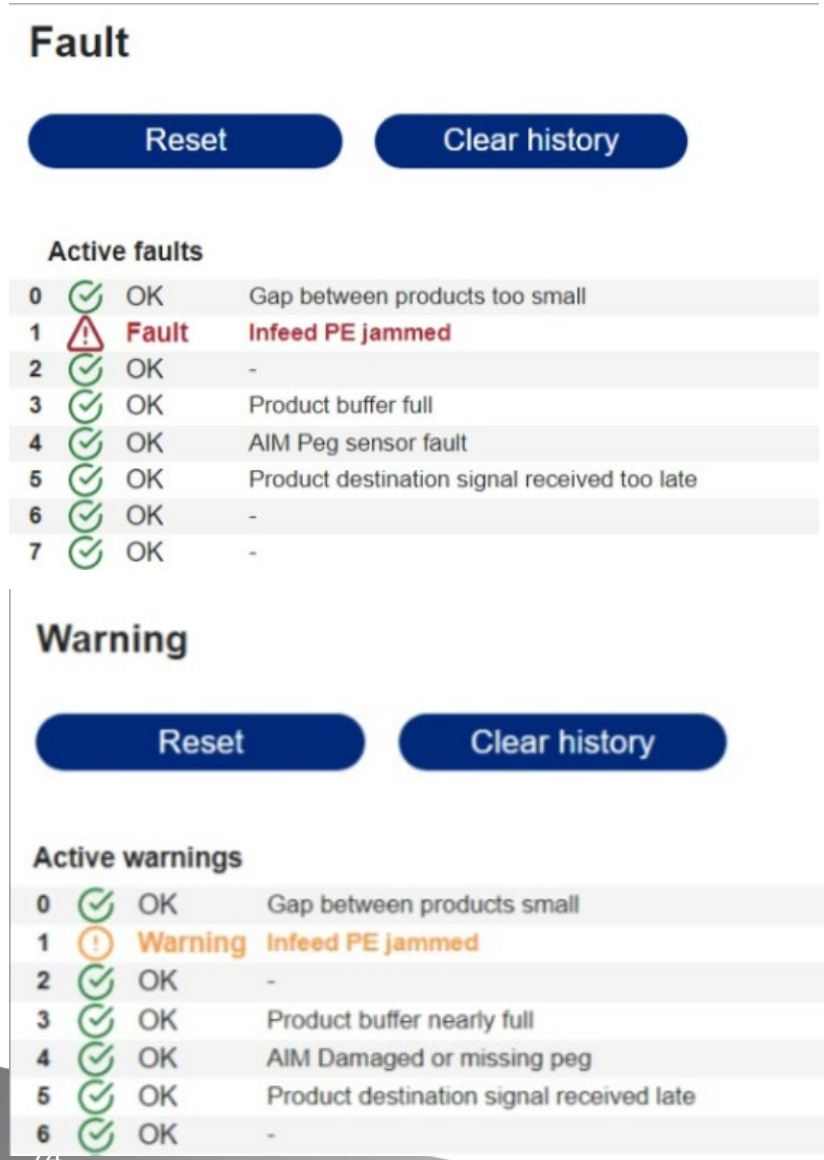
- **Determining Factors:** The size and shape of the products, the angle of trajectory, the speed of the conveyor, and the requirements of the downstream processes.
- **Impact:** The “Minimum Gap at Infeed” is a crucial parameter affecting the conveyor system’s efficiency, reliability, and product handling quality.

The value of the minimum gap is on the settings page, under the ‘Application Settings’ section, labeled as ‘Gap warning distance’.

The ‘Gap too small Warning’ feature is designed to alert the user when the gap between products approaches the minimum allowable limit. The value set for this warning should be slightly larger than the minimum gap value. This ensures that the warning is triggered before a fault occurs, providing an opportunity for preemptive action. Setting the ‘Gap Warning Distance’ to 0 effectively disables the gap warning feature. This means no warnings will be issued when the gap between products approaches the minimum limit.



2 Infeed PE Jammed Fault and Warning



This fault is activated if the Infeed PE identifies a product exceeding the maximum allowed size for a successful divert, or if the Infeed PE is obstructed due to a stranded product. The limit for the Infeed PE jammed is a fixed value established by Intralox during the assembly and testing of the equipment the value can be found on the 'equipment' page of the vHMI under 'Jam distance'. When this fault is triggered, the equipment will attempt to divert.

- Automatic Reset: The fault resets automatically once the Infeed PE is unblocked with the belt in motion.
- Manual Reset: Manual reset can be performed either via the vHMI 'fault' page or via the PLC. See ISC CAM network communication data interface file for more information.

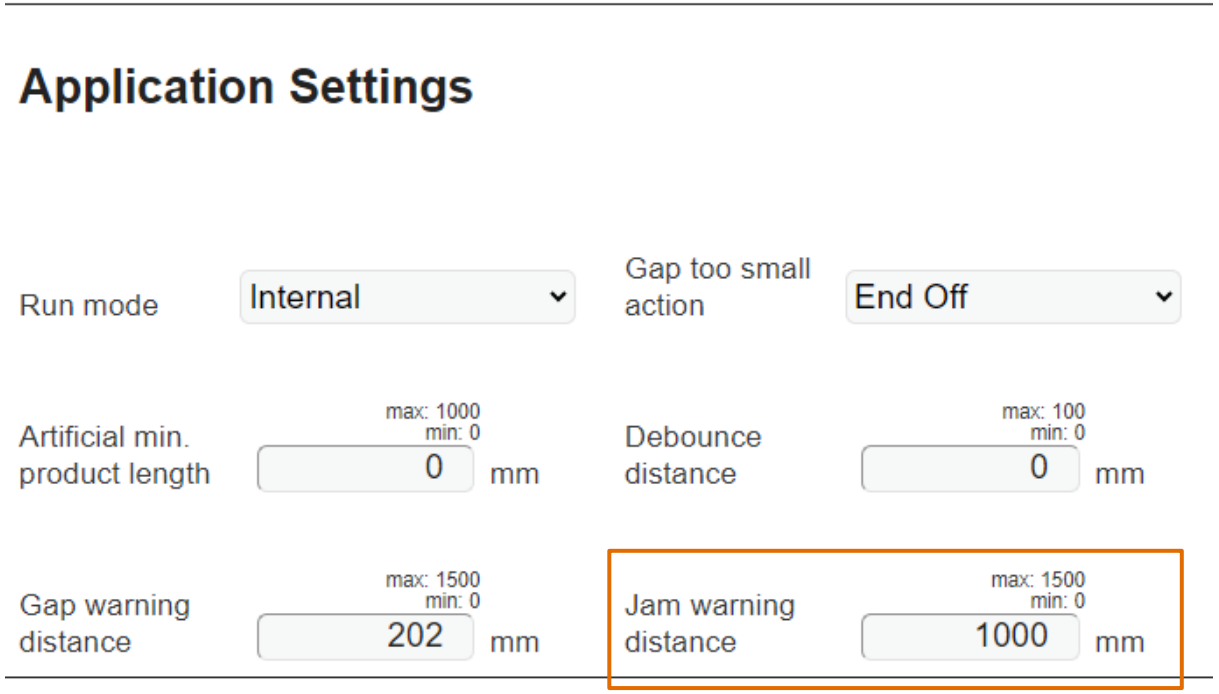
This warning is activated if the Infeed PE detects a product that is close to the maximum allowed product size required for the application to ensure a successful divert, or when the Infeed PE remains blocked due to a stranded product.

The Infeed PE jam warning is user-configurable on the 'Settings' page on the vHMI under 'Jam warning distance'. The value set for the Jam warning should be slightly smaller than the jam fault value, such that the warning is triggered prior to the fault. It is not possible to disable the warning.

Corrective Action:

- Limit the size of the products introduced.
- Improve the product transfer.

Set of Jam warning distance



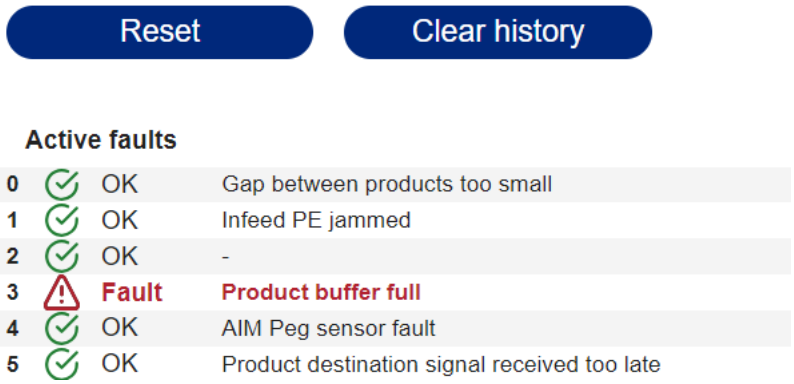
Jam Warning Distance: This term refers to the maximum allowed length of products at the Infeed photoeye. A product blocking the photo-eye beyond this distance is considered a jam.

- **Jam Identification:** A product blocking the photo-eye longer than this distance is identified as a jam.
- **Impact:** The “Jam Warning Distance” is a crucial parameter affecting the conveyor system’s efficiency, reliability, and product handling quality.

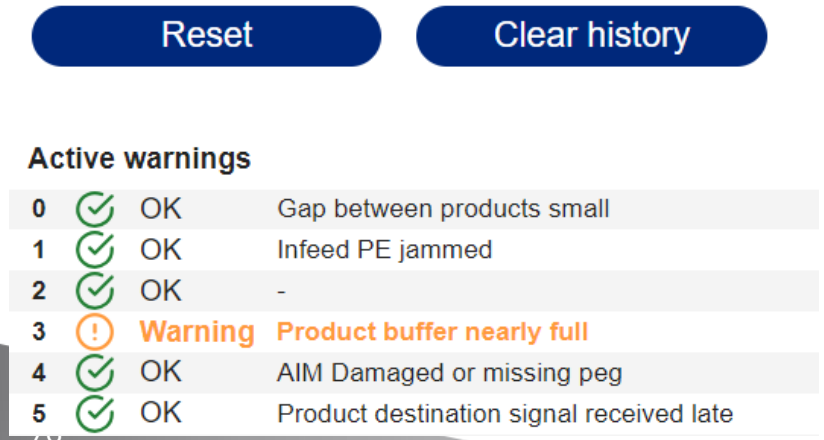
This distance serves as a warning to the user but does not hinder the machine’s operation. Always refer to the system’s documentation or consult an Intralox expert for precise information.

3 Product Buffer Full or nearly full

Fault



Warning



This fault is activated when the number of products on the equipment exceeds the tracking capacity of the ISC CAM. The buffer can track up to 32 products for sorters and S70x0 switches with a single valve bank. For S70x0 switches with a dual valve bank, the buffer can track up to 16 products.

When this fault is triggered and the buffer is full, the new products will be overwriting the existing products on the buffer. This will make the overwritten products to go end off (if retain more is off) or follow the previous product (if retain mode is on).

- Automatic Reset: The fault will automatically reset once a product enters the infeed photoeye and enough products have been diverted and removed from the buffer.
- Manual Reset: Pressing the ‘Reset Product Buffer button’ on the ‘settings’ page will empty/erase the product buffer. Any remaining product on the belt will to go end off (if retain more is off) or follow the previous product (if retain mode is on).

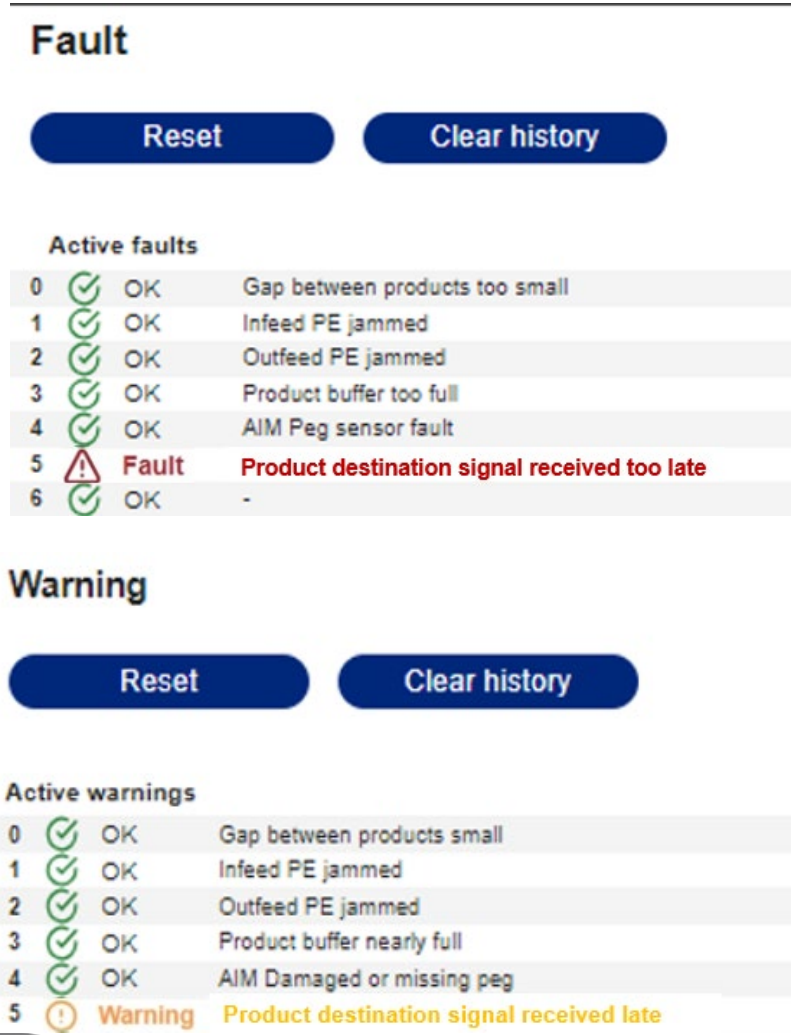
This warning is activated when there are 4 or fewer free spots available in the product buffer, indicating that the buffer is nearing its maximum capacity. The buffer can track up to 32 products for sorters and S70x0 switches with a single valve bank. For S70x0 switches with a dual valve bank, the buffer can track up to 16 products.

- Automatic Reset: The warning automatically resets once once a product enters the infeed photoeye and enough products have been diverted and removed from the buffer.
- Manual Reset: Pressing the ‘Reset Product Buffer button’ on the ‘settings’ page will empty/erase the product buffer. Any remaining product on the belt will not be acted upon.

Corrective Action:

- Limit the number of products on the belt.

4 Product destination signal received too late/late



This fault is activated when the PLC sends an updated product destination (or reject signal is set) too soon after a product has been detected by the Infeed PE. This can create ambiguity as to whether the update applies to the current product or the next one.
The exclusion time window, during which the PLC is not permitted to send destination updates, is a fixed value established by Intralox during the assembly and testing of the equipment. The value can be found on the 'equipment' page of the vHMI under 'PLC comm timing window'.

When this fault is triggered, the product will be diverted using the previous destination. The new destination will be applied to the next product arriving at the Infeed PE.

- Automatic reset: This fault automatically resets after a new change of destination is detected in timely manner.
- Manual Reset: Manual reset can be performed either via the vHMI 'fault' page or via the PLC. See ISC CAM network communication for more information.

This warning is activated when a change in product destination is sent by the line PLC (or reject signal is set) just before the product is detected by the Infeed PE. The warning window is a fixed value established by ILOX during the assembly and testing of the DPE (EQUIPMENT, PLC communication, PLC comm timing window).

- Automatic Reset: This warning automatically resets after a new change of destination is detected in timely manner.
- Manual Reset: Manual reset can be performed either via the vHMI 'fault' page or via the PLC. See ISC CAM network communication for more information.

Corrective Action:

Changes in the product destination should be sent earlier, ideally just after the previous product has been fully detected by the Infeed PE.

Equipment – Actuators / PLC comm.

Valve configuration:

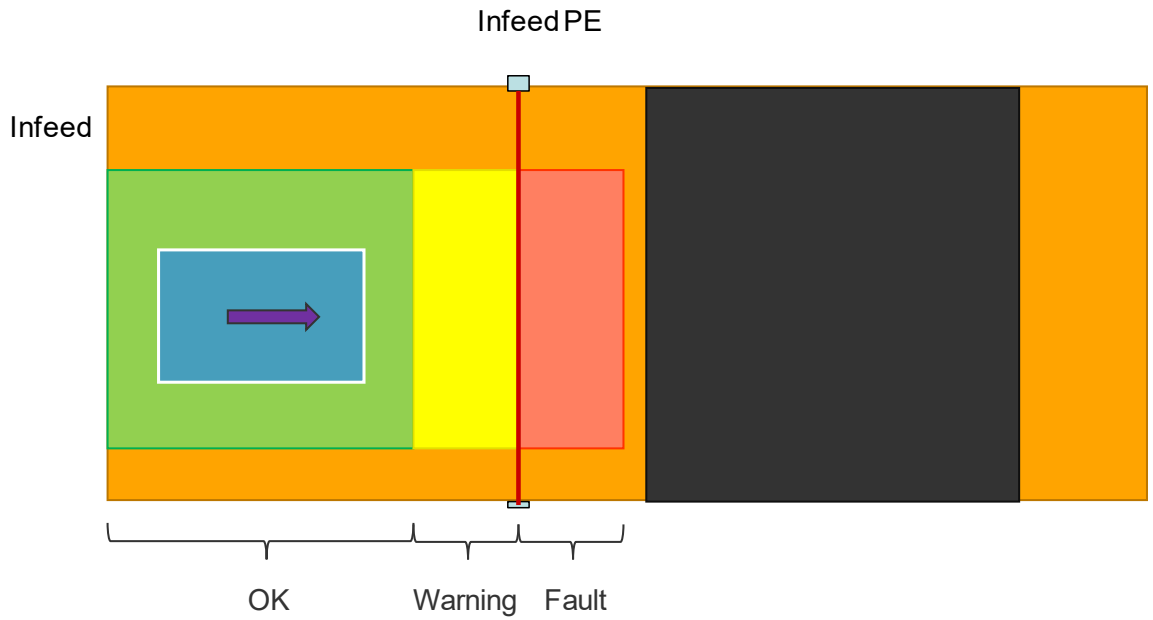
This is the activation method for Intralox Belt series used in the Intralox equipment.

PLC comm timing window:

Sets the size of the minimum time that the PLC should update the destination information prior to the product arriving at the infeed PE. If new destination information is received within this window prior to the product arriving at the infeed PE, a PLC Destination update critically late warning will be triggered. If new destination information is received within this window after the product has arrived at the infeed PE, a PLC Product Destination update received too late fault will be triggered.

Note: This value is also used by reject signal.

See ISC CAM Timing diagrams for more information.



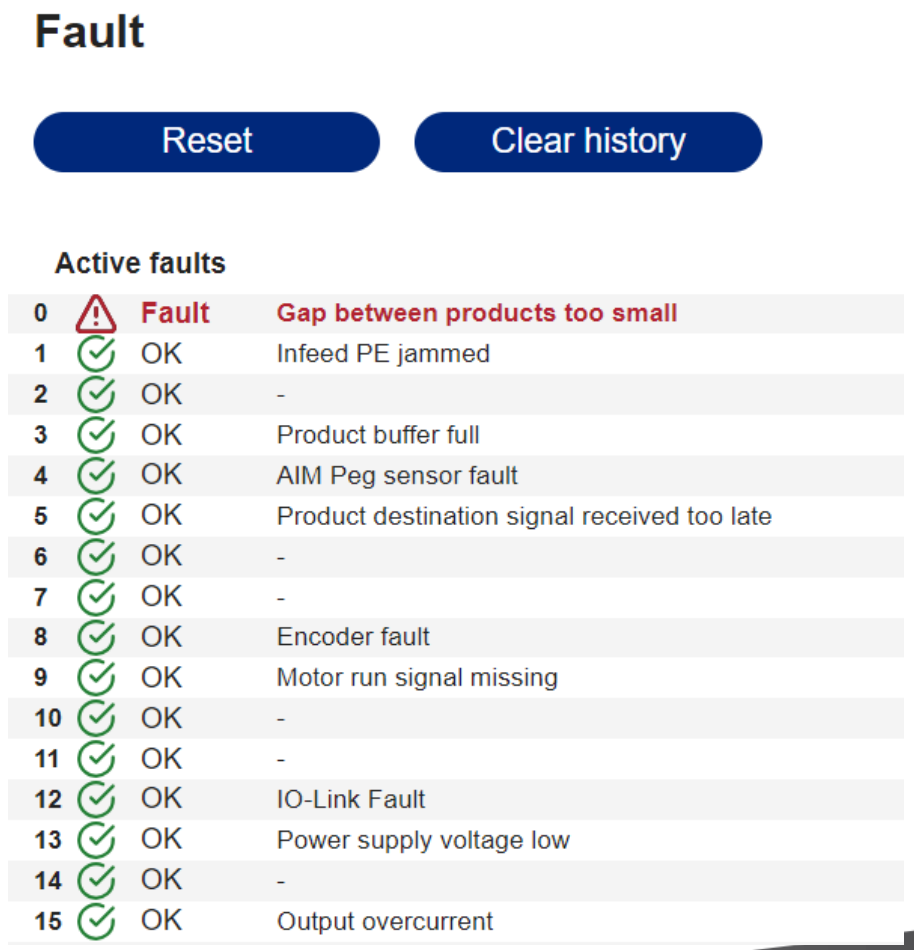
Fault reset

The following faults will only automatically reset when the fault conditions are not present at a fault specific trigger point, for example when new product arrives at the photo eye:

- Gap between products too small
- Infeed PE jammed
- Product buffer full
- AIM peg sensor fault
- Product destination signal received too late
- Encoder fault
- Motor run signal missing

It is possible to reset these faults before the next trigger by pressing the reset button in the fault part of the fault page or by sending a fault reset command from the PLC.

All other faults are periodically checked and reset if fault condition is not present.



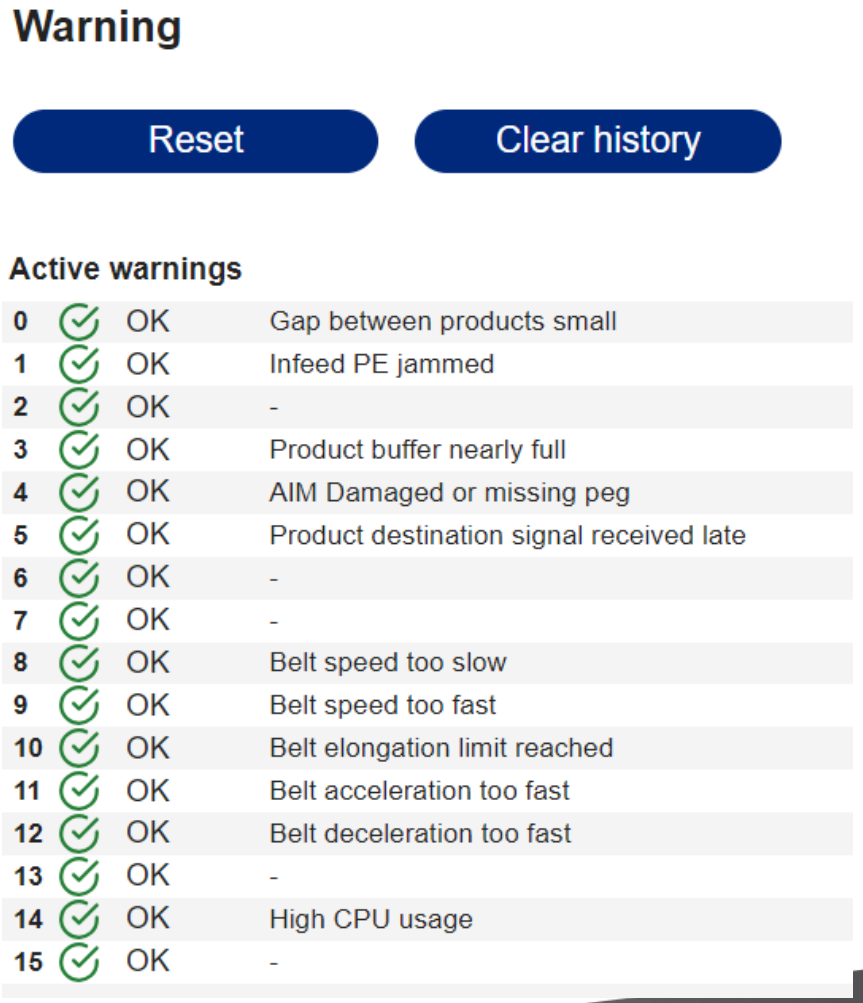
Warning reset

The following warnings will only automatically reset when the warning conditions are not present at a warning specific trigger point, for example when new product arrives at the photo eye:

- Gap between products small
- Infeed PE jammed
- Product buffer nearly full
- AIM Damaged or missing peg
- Product destination signal received late
- Belt elongation limit reached
- Belt acceleration too fast
- Belt deceleration too fast
- High CPU usage

It is possible to reset these warnings before the next trigger by pressing the reset button in the warning part of the fault page or by sending a warning reset command from the PLC.

All other warnings are periodically checked and reset if warning condition is not present.



Fault/Warning history

Fault

Reset | Clear history

Active faults

0	⚠	Fault	Gap between products too small
1	✓	OK	Infeed PE jammed
2	✓	OK	-
3	✓	OK	Product buffer full
4	✓	OK	AIM Peg sensor fault

Active faults

Fault history: A - Most recent fault / P - Oldest fault

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
⚠	–	–	⚠	–	–	–	–	–	–	–	–	–	–	–	–
–	⚠	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	⚠	⚠	⚠	⚠	⚠	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Fault history

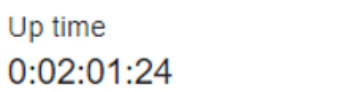
In the fault page it is possible to see the fault and warning history.
The symbols in front of a fault/warning indicate what faults/warnings are currently active.

The columns A → P show the fault/warning history.
Every time the fault/warning status changes to more or less faults/warnings, the previous status is stored in the history. At the same time the older history values will be shifted one column to the right.
The history information is shown as newest on the left and oldest on the right.

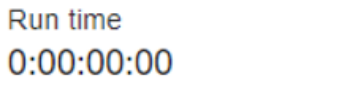
Clear history
It is possible to reset the fault/warning history by pressing the ‘Clear history’ button.

Attachment: Page indications

Live Info – System Information

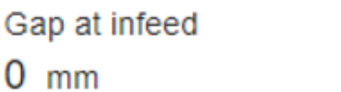


Uptime: Measures the duration how long the ISC CAM has been powered on since the last reboot

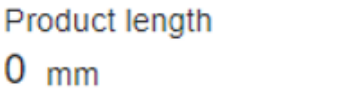


Run Time: The actual time a machine is actively performing its function. For example, if a machine is powered on for 8 hours but only manufacturing for 6 hours, the run time is 6 hours. This metric helps assess efficiency and productivity.

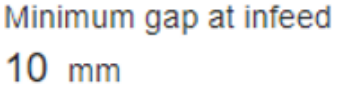
Stand-by Time: The time a machine has been powered on in total



Gap at Infeed: The intentional spacing between products at infeed photo eye. Controlling this distance is crucial for sortation, quality control, efficiency, and damage prevention.

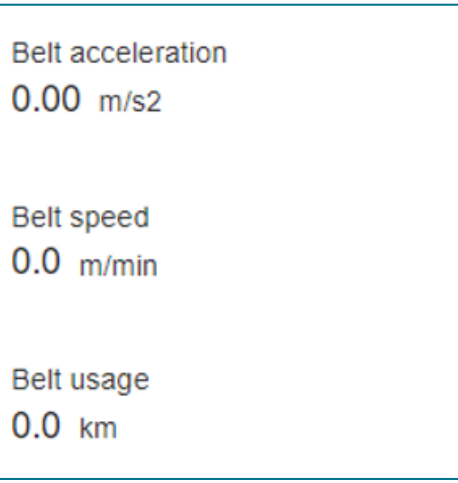


Product Length: The measured length of the item on the conveyor. Product length influences conveyor design, system efficiency, sortation, handling, and safety. Longer products may require larger gaps to prevent collisions or overlapping.



Minimum Gap at Infeed: Refers to the smallest allowable distance between products. This displays the value that is set on the equipment configuration. Factors include product size, shape, conveyor speed, and downstream process requirements. Consult an Intralox expert to determine the appropriate gap for your application.

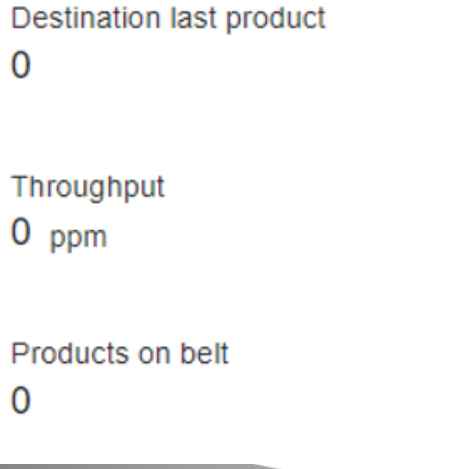
Live Info – System Information



Belt Acceleration: The rate at which the conveyor belt speed increases, impacting efficiency, reliability, and product handling quality.

Belt Speed: The rate at which the conveyor belt moves, typically expressed in feet per minute (ft/min) or meters per minute (m/min). Optimal speed varies based on application and system design.

Belt Usage: The total distance the conveyor belt has traveled over its lifetime. Important for maintenance planning, cost estimation, performance monitoring, and predictive maintenance.



Destination Last Product: The destination where the last product was assigned to.

Throughput: Measures the number of products conveyed in a minute, expressed as products per minute (ppm).

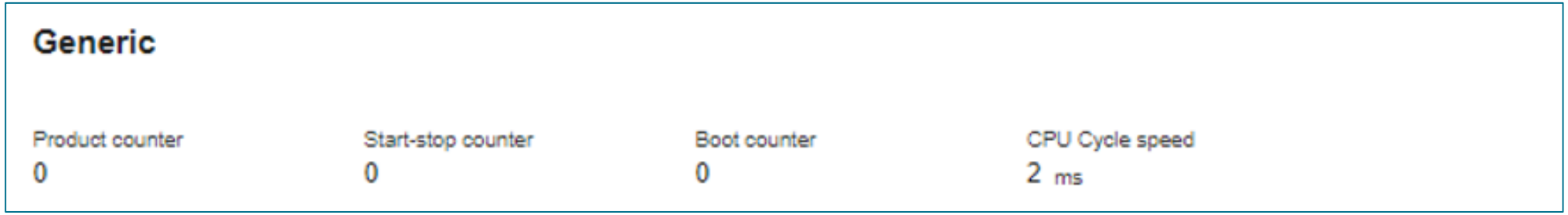
Products on Belt: The number of products currently on the belt. It impacts throughput, efficiency, safety, and resource utilization. Too many products can cause collisions and jams, while optimal loading enhances productivity.

Live Info – System Information

Product Buffer Slots Free: Refers to the number of unoccupied slots in the product buffer. Default buffer size is 32 products.

- **Efficiency:** Allows the system to accommodate incoming products without delays.
- **Flexibility:** Provides flexibility in production speed, product arrival times, and downstream processing.
- **Throughput:** Directly impacts system throughput; insufficient slots can slow down or stop the system.
- **Resource Utilization:** Helps in resource planning, ensuring the buffer is neither underutilized nor overutilized.

Maintenance - Generic



Product Counter: This counter keeps track of the total number of valid products that have passed the infeed photoeye since the system started counting. The count is updated each time a product is detected by the infeed product sensor.

Start-Stop Counter: This counter refers to the number of times the conveyor has started and stopped, useful in applications where the conveyor needs to frequently start and stop. Each start and stop of the conveyor is considered a cycle, and the counter increments by one each time.

Boot Counter: This counter refers to the number of times the conveyor system has been powered on or “booted up”, useful for maintenance and troubleshooting purposes. Each time the conveyor turns on the system considers a “boot-up”, and the counter increments by one each time.

CPU Cycle Speed: This is the speed at which a CPU if currently performing. When we talk about CPU cycle speed in milliseconds (ms), we’re referring to the time it takes for the CPU to complete one program cycle.

For the area “Timers ” refer the information on the live-info screen.

Maintenance –Belt

Belt

Usage	Average speed	Max. speed	Max. acceleration	Max. deceleration
0.0 km	0.0 m/min	0.0 m/min	0.00 m/s2	0.00 m/s2

Belt Usage: This refers to the total distance the conveyor belt has traveled over its lifetime, similar to a vehicle's mileage.

- Helps plan for maintenance and replacement.
- Estimates the cost of operation.
- Provides insights into system performance.
- Identifies potential issues before failures.

Average Speed: The rate at which the conveyor belt moves, typically in feet per minute (ft/min) or meters per minute (m/min).

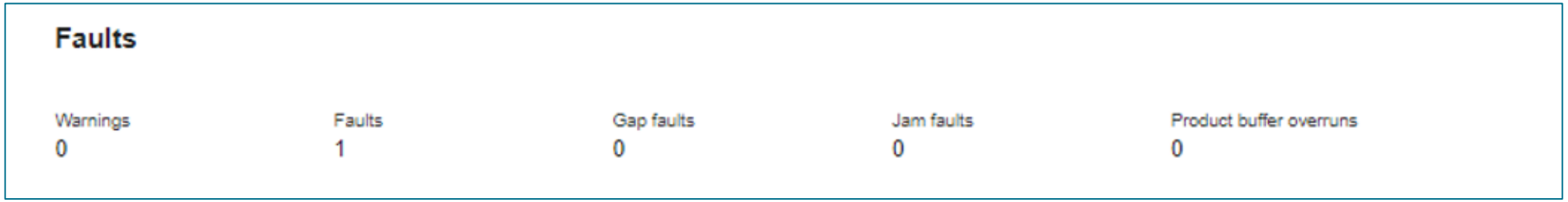
Max. Speed: The maximum rate at which the conveyor belt has moved, expressed in ft/min or m/min.

Max. Acceleration: The rate at which the conveyor belt's speed increases, crucial for system efficiency and reliability.

Max. Deceleration: The rate at which the conveyor belt's speed decreases, impacting system efficiency and product handling quality.

Notes： Always refer to the system's documentation or consult an Intralox expert for precise information.

Maintenance – Faults and activations counters



Warnings, faults, Gap faults, Jam faults, Product buffer overruns:

More in-depth information can be found on the “fault” page which is a crucial tool for system maintenance and troubleshooting. It provides detailed diagnostic information about system warnings and faults, which can be invaluable for identifying and resolving issues. . It can help you catch and address issues before they lead to system downtime or other serious problems.

Active carryway (1-3): These counters keep a count of the total number of activations on an active carryway since the system started counting. This count is updated each time an active carryway activated.

Equipment - Generic

Generic

Application: The functionality that the Intralox equipment performs when diverting products, such as a Sorter or Switch.

Conveyor Length: The length of the Intralox equipment frame.

Sprocket Teeth: The number of teeth on the sprocket.

Min. Gap Size: The minimum allowed distance between products.

Jam Distance: The largest allowable length of products at the infeed photoeye. A product blocking the photo-eye beyond this distance is considered a jam, impacting system efficiency, reliability, and product handling quality.

Belt

Belt Type: The Intralox Belt series used in the Intralox equipment.

Pitch: The length of the belt module.

Width: The width of the belt.

Min. Speed: The **recommended** minimum belt speed of the Intralox equipment.

Max. Speed: The **recommended** maximum belt speed of the Intralox equipment.

Max. Acceleration: The recommended maximum belt acceleration of the Intralox equipment.

Max. Deceleration: The recommended maximum belt deceleration of the Intralox equipment.

Equipment – Encoder and Infeed sensor

Encoder:

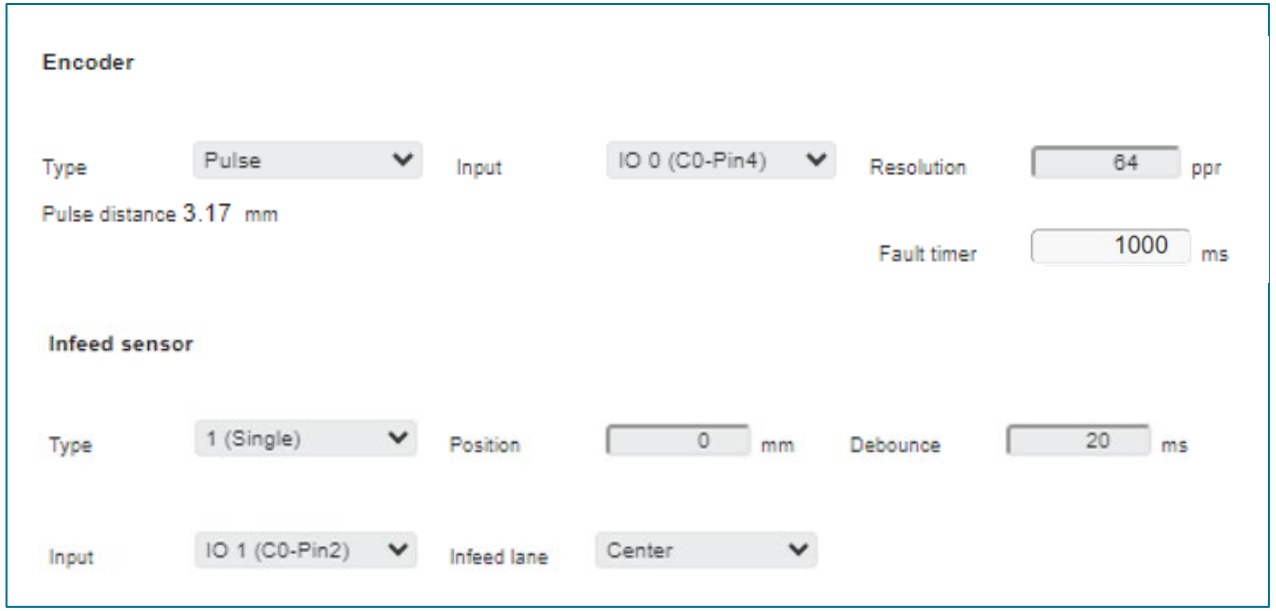
Sets the Encoder type used

- **DI - Pulse:** Standard pulse encoder physically connected to the ISC CAM.

Input: This is the port and pin used as the input for the encoder
Resolution: Number of pulses generated by the encoder per revolution. Standard = 64 pulse/rev

Fault timer: The time after which an encoder fault is triggered.

Belt Travel/pulse: Conversion of the belt travel distance in inches/mm per each encoder pulse.



Infeed sensor (Infeed photo eye)

1 (single DI): a single physical infeed PE is connected to the ISC CAM.

Position: Distance from the “zero-location”

Debounce: Debounce time for a photo-eye is the built-in delay in the sensor to prevent false triggering due to transient conditions. It’s a brief pause that ensures the sensor is activated only by a deliberate change in the detected condition, not by temporary fluctuations.

Input: This is the port and pin used as the input for the infeed photo-eye.
Infeed lane: This indicates the induct location of the product.

Equipment – Active carryways

Activation angle: The angle the product will travel with after activation.

Activation zone width: The width of the activation zone(s)

Active carryways: Number of active carryways in the equipment

Active carryway port offset: Sets the where the first divert is connected to the ISC CAM.

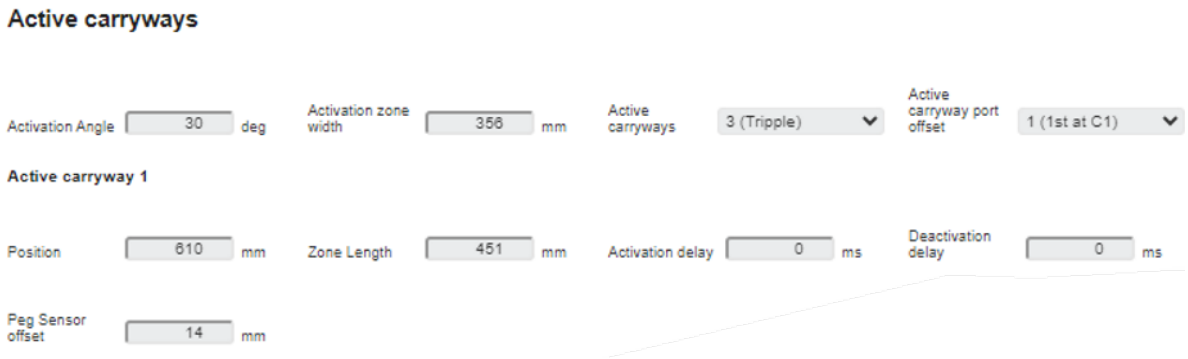
Position: Distance from the “zero-location”

Zone length: Length of a single zone.

Activation delay: Standard mechanical delay from the valve activation signal to activated carryway.

De-activation delay: Standard mechanical delay from the valve deactivation signal to deactivated carryway.

Peg sensor offset: Peg sensor distance from the diverter paddle.



IO-COMM

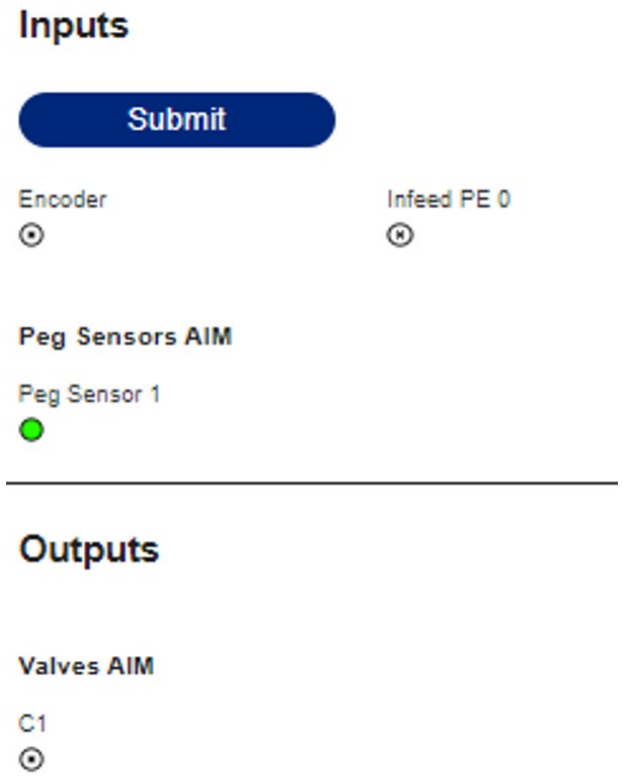
Encoder: The is an indicator showing the status of the encoder. The indicator is just an indication, please use the IO-trace for more detail.

Infeed PE 0: The is an indicator showing the status of the photo-eye. The indicator is just an indication, please use the IO-trace for more detail.

Peg sensor (1-3): The is an indicator showing the status of the peg sensor. The indicator is just an indication, please use the IO-trace for more detail.

Valve AIM: The is an indicator showing the status of the valve. The indicator is just an indication, please use the IO-trace for more detail.

RAW IO: The is an indicator showing the status of all IO's. The indicator is just an indication, please use the IO-trace for more detail.



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