



COMMISSIONING AND INTEGRATION MANUAL
IDL-C-2.0

ISC CARRYWAY AUTOMATION MODULE

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1 COMMISSIONING AND INTEGRATION OVERVIEW

NOTE: Before commissioning ISC CAM, follow all installation and operation procedures in the equipment user manual.

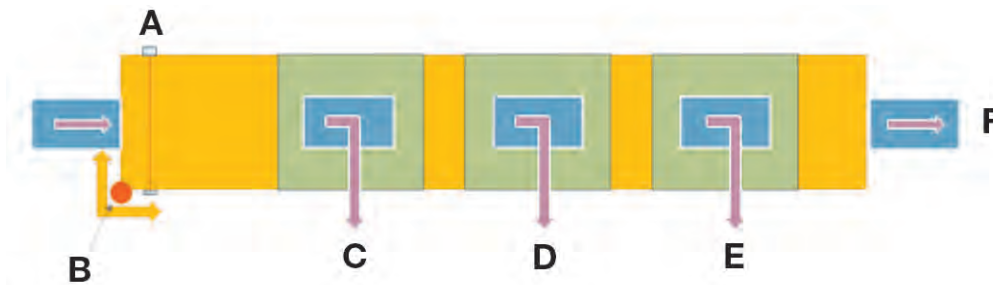
This document contains the information required to commission and configure an Intralox® Smart Carryway Carryway Automation Module (ISC CAM) with Intralox Divert Logic Controller (IDL-C) version 2.x. Commission ISC CAM by completing the following process in order:

1. Connect the cables to the ISC CAM and enable power.
2. Access the web-based HMI and verify hardware connectivity.
3. Configure network settings with the Intralox Service Tool (optional).
4. Integrate with a PLC or product inspection system. If not integrating with a PLC or product inspection system, configure internal mode destination settings in the HMI for autonomous operation.
5. Conduct a test run with products.
6. Adjust product trajectories and other HMI settings as needed.
7. Export and back up the settings.

The ISC CAM directs products to numbered destinations. The number and location of destinations depend on the equipment technology, series, and configuration. See the equipment technical package for more information.

SORTER DESTINATION NUMBERS

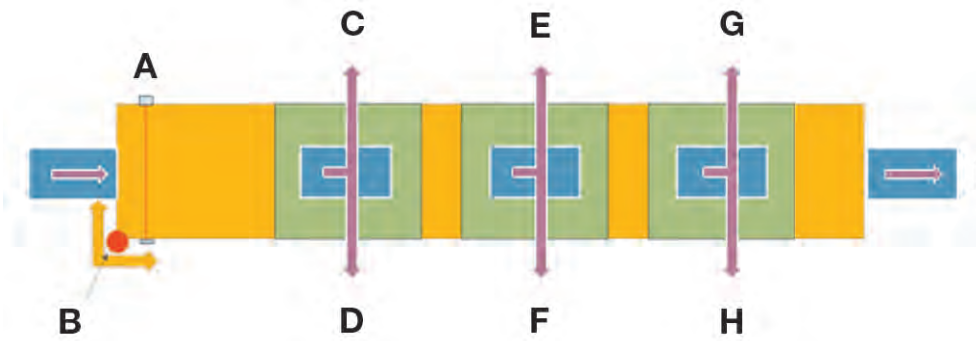
Sorter active carryway destinations are numbered as shown. Assign destinations to products with PLC signals or set the quantity of products to direct to each destination in the web-based HMI. Use the web-based HMI to adjust and optimize the product trajectory for each destination.



- | | |
|-----------------|---------------------------|
| A infeed PE | D destination 2 |
| B zero position | E destination 3 |
| C destination 1 | F destination 0 (end off) |

Figure 1: Unidirectional Sorter AIM/DARB S7000/S7050 destination numbers

1 COMMISSIONING AND INTEGRATION OVERVIEW

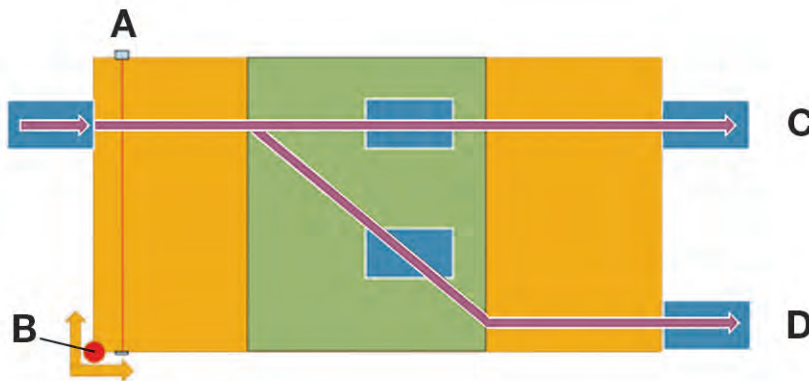


- A infeed PE
- B zero position
- C destination 1
- D destination 2
- E destination 3
- F destination 4
- G destination 5
- H destination 6
- I destination 0 (end off)

Figure 2: Bi-directional Sorter S7000/S7050 destination numbers

SWITCH DESTINATION NUMBERS

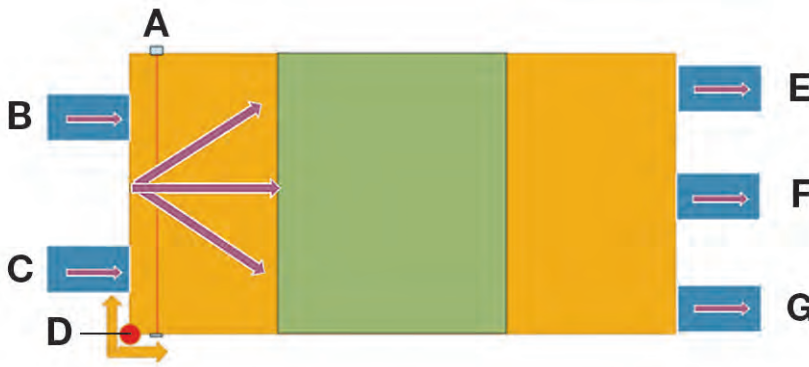
Switch active carryway destinations are numbered as shown. Use the web-based HMI to configure settings for each destination.



- A infeed PE
- B zero position
- C destination 1
- D destination 2

Figure 3: AIM/DARB S7000/S7050 Switch destination numbers

1 COMMISSIONING AND INTEGRATION OVERVIEW



A infeed PE
B infeed 1
C infeed 2
D zero position
E destination 1
F destination 2
G destination 3

Figure 4: Destinations Switch 1-3 / 2-3: S7000/S7050 (Only available for a single infeed PE)

RUN MODE

The ISC CAM can receive destination information for each product from a PLC or inspector (external mode), or it can autonomously direct a specified quantity of products to each destination (internal mode).

PLC / EXTERNAL MODE

If ISC CAM is set to PLC / External Mode, the ISC CAM receives destination information for each product from a parent device, such as a line PLC or an inspector. ISC CAM does not work in PLC/External Mode without a PLC or parent device connected over ethernet or a 24-VDC discrete IO connection.

To integrate with a PLC and use PLC/External mode, see [PLC Integration](#) after completing the commissioning procedures.

The following example shows a possible application of PLC / External Mode:

A DARB Sorter S4500 diverts to three (3) destinations. The PLC communicates destination information for each product. In this animation, the PLC directs green products to destination 1, blue products to destination 2, and red products to destination 3. [Animation](#)

INTERNAL MODE

When set to Internal Mode, ISC CAM directs products to destinations in specified quantities. Specify the quantity of products directed to each destination with a PLC command or under **Internal mode destination** on the **Settings** HMI page.

Internal mode works with or without PLC or inspector. A PLC or inspector can update destination quantities and receive faults and warnings. Intralox recommends connecting ISC CAM to a PLC even when operating in internal mode to communicate faults and other basic information. To use ISC CAM without a PLC, see [Use Internal Mode Without a PLC](#) after completing the commissioning procedures. To use ISC CAM in internal mode with a PLC, see [PLC Integration](#) after completing the commissioning procedures.

The following examples show possible applications of the Internal Mode.

1. An ARB Switch S7000 exits to three (3) destinations. Direct two (2) products to destination 1, two (2) products to destination 2, and two (2) products to destination 3. [Animation](#)
2. An ARB Switch S7000 exits to three (3) destinations. Direct one (1) product to destination 1, three (3) products to destination 2, and five (5) products to destination 3. [Animation](#)

2 COMMISSIONING

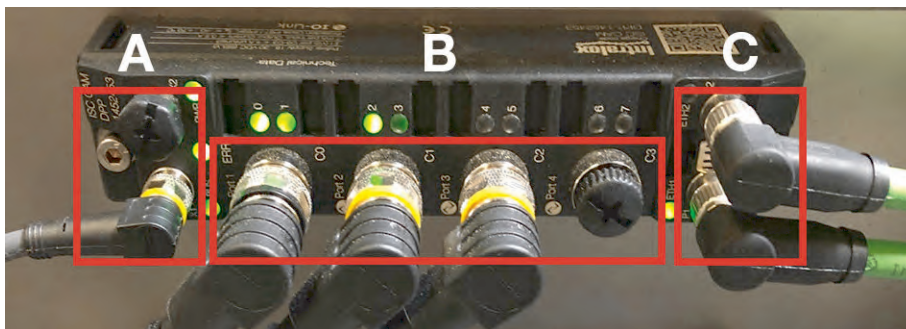
Intralox mounts and configures the ISC CAM device at the factory. To commission the ISC CAM device for use, connect the cables, enable power, and configure the network to access the web-based HMI before confirming hardware connectivity.

After completing the commissioning process and verifying hardware connectivity, see [PLC Integration](#) to integrate with a PLC or inspector, or skip to [Use Internal Mode Without a PLC](#).

CONNECT CABLES TO ISC CAM

1. On the ISC CAM ISC webpage (<https://intralox.com/isccam>), locate and open the connection diagram for the equipment technology (AIM, DARB, or S7000/S7050).
2. Connect the power, communication, and network cables to the connectors according to the connection diagram for your equipment.

NOTE: Some ports may not be used. See the connection diagram for more information.



A power

B C0-C3

C Ethernet

Figure 5: ISC CAM ports

Cables are color-coded as specified in the connection diagram. Some have colored rings on the connectors and others have colored cables (for example, network cables are green).

3. Tighten the adapters and cable connectors to the torque specifications in the connection diagram.

NOTE: ISC CAM achieves IP65-67-69K ingress protection when connectors are properly torqued and dust caps cover unused ports. If connector torque is insufficient, dust and water can intrude and vibration can cause the connectors to loosen further.

TURN ON ISC CAM

1. Enable power to the ISC CAM.

2. Wait for the ISC CAM to boot.

The boot process takes about 20 seconds, during which LEDs flash and change color. The boot process is complete when the PWR and ERR LEDs are green and the BUS LED flashes green three (3) times. If any LED remains red, see the ISC CAM Troubleshooting Guide for more information.



A BUS, ERR, and PWR LEDs

B ETH1 and ETH2 LEDs

Figure 6: Verify power status

3. Verify the ISC CAM connected to the network.

ACCESS HMI TO VERIFY HARDWARE COMMUNICATION

Access the ISC CAM web-based human-machine interface (HMI) to view live information and verify hardware is properly connected to the ISC CAM.

1. Use an M12 ethernet cable to connect the device with an internet browser to the network port on the ISC CAM (ETH1 or ETH2).
The ETH1 and ETH2 LEDs flash green (100-megabit connection) or yellow (10-megabit connection) to indicate a network connection. If any LED is red, see the ISC CAM Troubleshooting Guide.
2. Enter the default ISC CAM IP address **192.168.1.254** in the address bar of an internet browser to access the HMI. The **Live Info** HMI page loads.
If the HMI does not load, ensure your device ethernet adapter is configured with an IP address in the 192.168.1.x subnet range and verify the ethernet cable connection.
3. Verify the serial number in the information bar at the bottom of the HMI matches the serial number on the Intralox equipment ID name (EIN) plate.
If the serial numbers do not match, the ISC CAM configuration file is missing or corrupt. Contact Intralox Customer Service before proceeding.

WEB-BASED HMI OVERVIEW

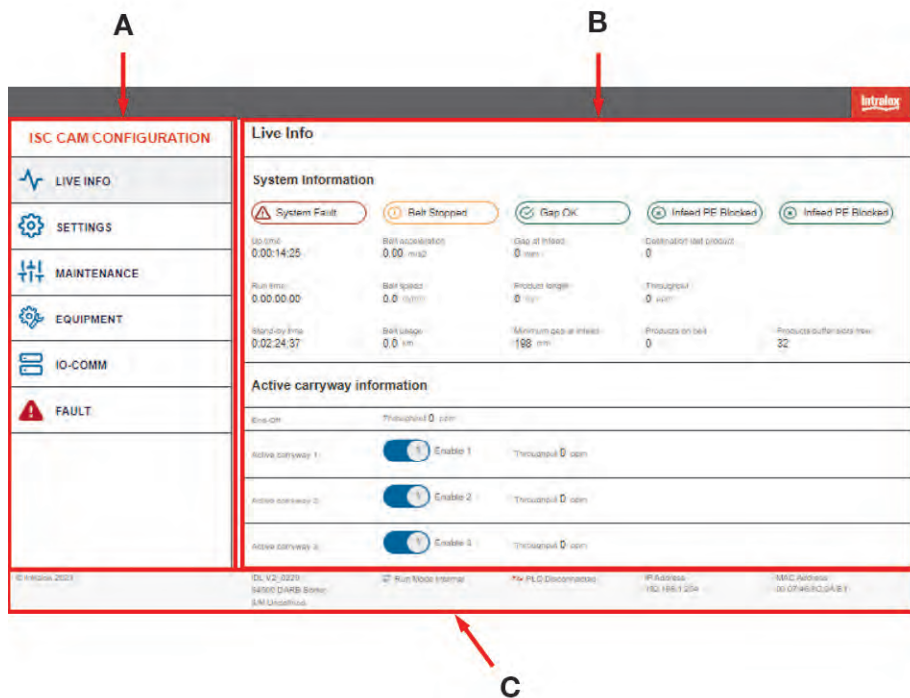
Use the web-based HMI to monitor, configure, or troubleshoot ISC CAM. To access the web-based HMI, click the IP address listed in the Intralox Service Tool or enter the ISC CAM IP address in a web browser.

The web-based HMI has six (6) pages:

- **Live Info**
 - View live information about ISC CAM operation and throughput.
 - Click toggles to enable or disable an active carryway.
- **Settings**
 - Set run mode (internal or external).
 - Set quantities of products to direct to each destination (internal mode without PLC control).
 - Adjust divert trajectory parameters and presets ("recipes") to optimize performance and accommodate different product characteristics.
 - Export and import all settings.

2 COMMISSIONING

- **Maintenance**
 - View parameters related to maintenance.
- **Equipment**
 - View parameters about the equipment configuration.
- **IO-COMM**
 - View live information about valve and PLC communication.
 - Click toggles to override (manually activate or deactivate) valves.
- **Fault**
 - View details about current faults and warnings.
 - View fault and warning history.

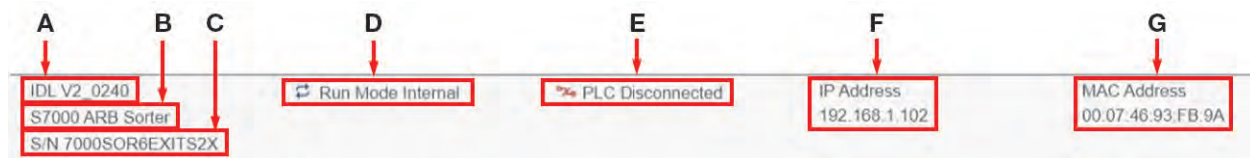


A HMI page navigation

B current page

C information bar

Figure 7: Web-based HMI interface



A firmware version

B belt type, technology, and equipment type

C equipment serial number

D run mode

Figure 8: HMI information bar

E PLC connection status

F IP address

G MAC address

VERIFY HARDWARE CONNECTIVITY

After connecting to the HMI, follow this procedure to ensure the sensors and valves are properly connected.

1. Ensure there are no active faults or warnings on the Live Info HMI homepage.
If faults or warnings occur, see the *ISC CAM Troubleshooting and Reference Manual* for more information.
2. Block the infeed PE and verify that the **Infeed PE Clear** indicator changes to **Infeed PE Blocked**.
If the indicator does not change, verify the infeed PE is connected properly.
3. Run the equipment without products and verify that the **Belt not running** indicator changes to **Belt Running**.
If the indicator does not change, verify the drive encoder is connected properly.



Figure 9: Belt running indicator

CONFIGURE NETWORK WITH SERVICE TOOL

Remotely configure the ISC CAM network settings with a PLC, or from any Windows Computer with the Intralox Service Tool (available at <https://intralox.com/isccam>). Follow this procedure to configure the IP address (all PLC integration) and PROFINET name (Siemens only) with the Intralox Service Tool. For more information about remotely configuring the ISC CAM network settings with a PLC, see [PLC Integration](#).

1. Click **Search** to discover ISC CAM devices on the network.
Devices are discovered using the PROFINET Device Configuration Protocol (DCP).
2. Click the device to select it.
3. Click **Change**.
4. Enter a **Station name**, **IP address**, **Netmask**, and **Gateway**.

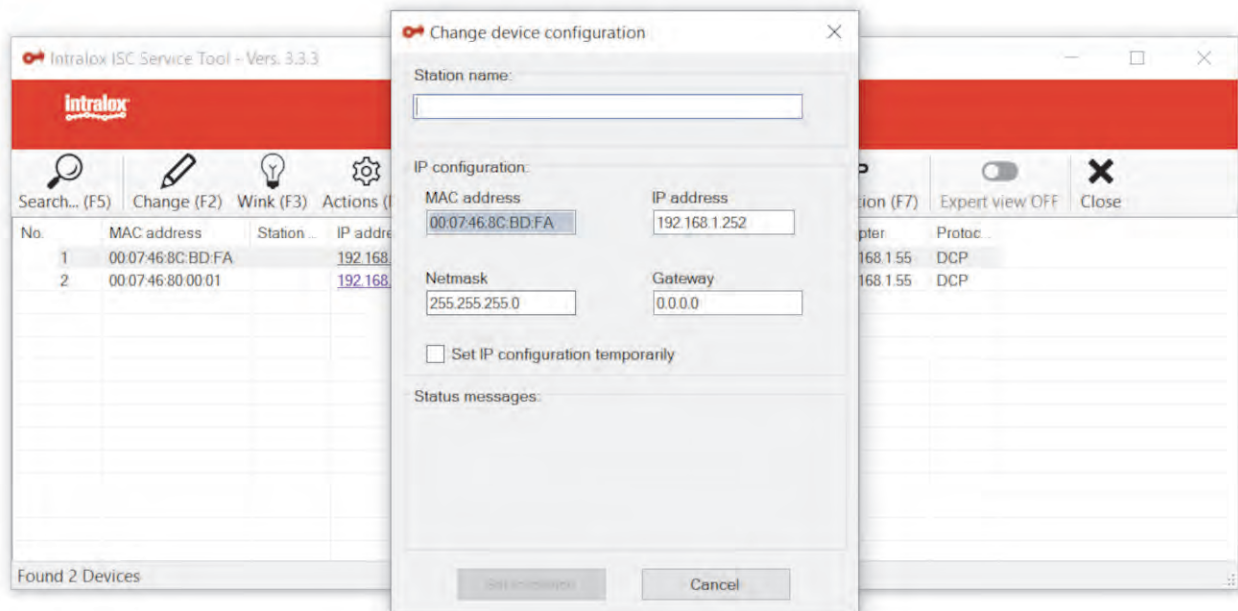


Figure 10: Change ISC CAM device configuration

5. Click **Set in device** to apply the changes.
6. Click **Actions** then **Reboot** to reboot the device.
7. Wait 20 seconds for the device to reboot.
8. Verify changes are correctly applied.

3 PLC INTEGRATION

This section contains information about integrating with a PLC or inspector. If using ISC CAM without PLC integration, skip this section and see [Use Internal Mode Without a PLC](#).

Many ISC CAM parameters can be set with PLC commands. Intralox provides resources and support to integrate ISC CAM with Siemens controllers (via PROFINET), Rockwell controllers (via EthernetIP), and any PLC that supports Generic Ethernet Device (GED) and Electronic Data Sheet (EDS) files. ISC CAM automatically detects the communication protocol (PROFINET or Ethernet/IP). A PLC or product inspection system (checkweigher, scanner, or camera) can also reject products through a 24-VDC discrete IO connection.

CONNECTION OPTIONS

When the ISC CAM run mode is set to **Internal mode**, ISC CAM autonomously sends products to destinations. When the ISC CAM run mode is set to **External mode**, a parent device, such as a PLC or product inspection system, controls each product destination. When the ISC CAM run mode is set to **External mode**, the parent device can communicate with the ISC CAM in two (2) ways:

- **Ethernet** enables the sending and receiving of complex instructions. Ethernet is usually the preferred option. This mode enables the parent device to update the settings of the ISC CAM and to receive detailed status and error information.
- **24-VDC discrete IO connection** is for high speed reject signals, typically from an inspector. High-speed reject

NOTE: In some situations, using both ethernet and 24-VDC discrete IO connection is necessary to maximize equipment performance.

COMMAND PRIORITIZATION

The ISC CAM prioritizes inputs in the following order:

1. 24-VDC discrete IO connection (high speed reject signals)
2. Ethernet
3. Web-based HMI settings

Parent device communications always override HMI settings. Verify the PLC communicates the required parameters, regardless of whether the HMI is in internal mode or external mode.

PLC SIGNALS

This section includes information about PLC signal function and timing. Use this information to integrate ISC CAM with a line PLC.

BASIC SIGNALS FROM PLC

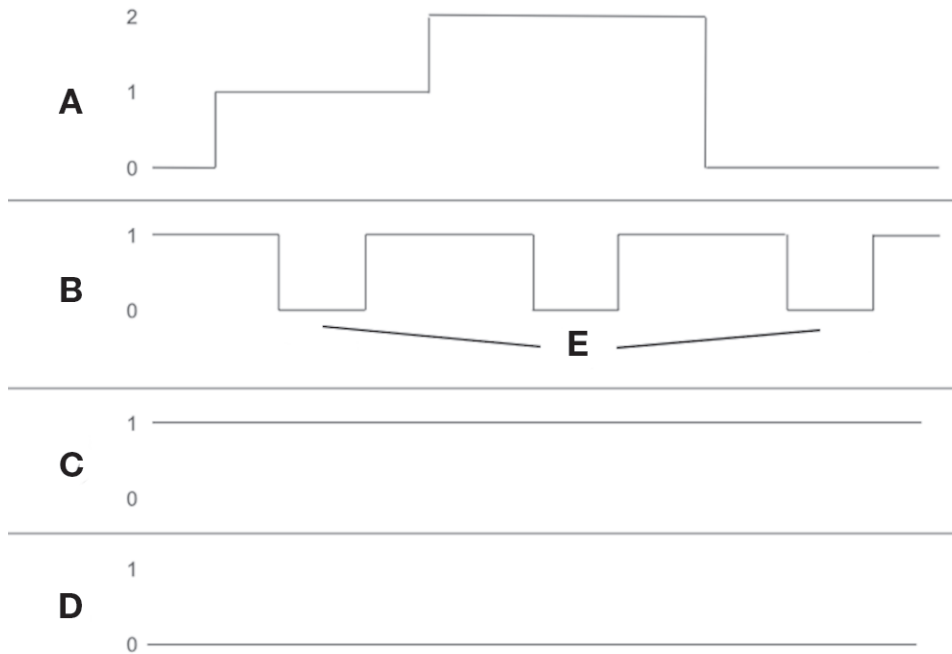
Ensure the PLC communicates the following basic signals to the ISC CAM:

- **Motor running:** Turn on this signal whenever the motor is running. If the signal is not set, the ISC CAM generates a fault.
- **Active carryway enable right/left (bi-directional belts only):** For bi-directional belts, enable the applicable directions for all active carryways.
- **Active carryway enable (unidirectional belts only):** For unidirectional belts, enable the applicable active carryways.
- **Run mode:** Set the run mode to internal or external. In external mode, the PLC must assign a destination for each product. In internal mode, the PLC must provide the quantity of products to direct to each destination.

EXTERNAL MODE

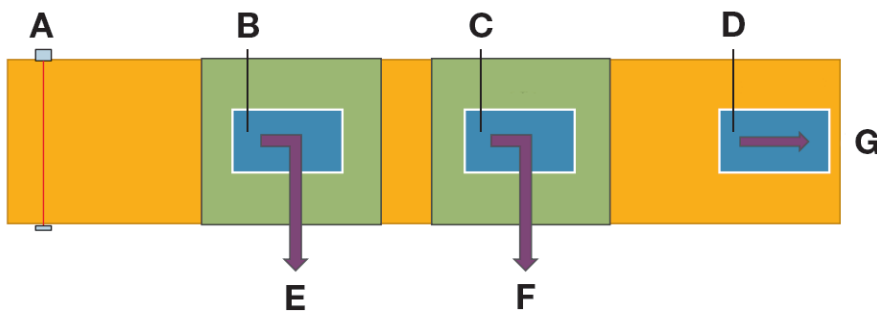
When ISC CAM operates in external mode, the PLC must send the destination information for each product. For ISC CAM to operate in external mode, the **run mode external** command must be true and the **run mode internal** command must be false.

In this example, the PLC signals direct product 1 to destination 1, product 2 to destination 2, and product 3 to destination 0 (end off).



- A product destination signal
- B infeed PE signal
- C run mode external
- D run mode internal
- E products block photoelectric sensor

Figure 11: External mode signal timing



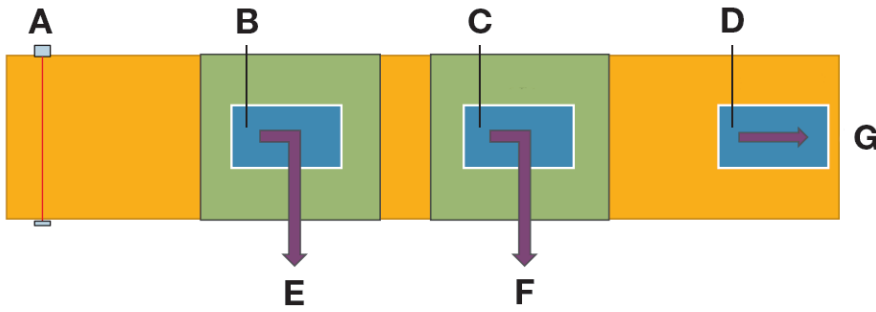
- A infeed PE signal
- B product 1
- C product 2
- D product 3
- E destination 1
- F destination 2
- G destination 0 / end off

Figure 12: External mode signal results

INTERNAL MODE

When ISC CAM operates in internal mode, products are directed to destinations in certain quantities. When the ISC CAM is connected to a PLC, the PLC must indicate the quantity of products to direct to each destination.

In this example, internal mode is configured to send one (1) product to each destination.



- A infeed PE signal
- B product 1
- C product 2
- D product 3
- E destination 1
- F destination 2
- G destination 0 / end off

Figure 13: Internal mode configuration results

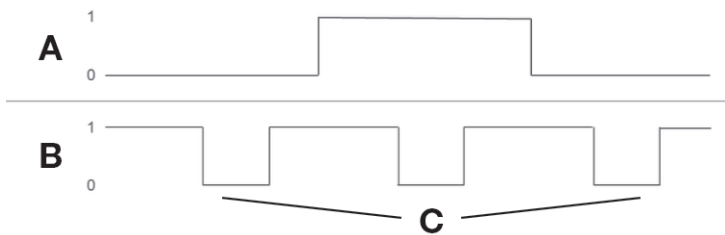
REJECT PRODUCTS WITH 24-VDC DISCRETE IO CONNECTION

When active, the 24-VDC discrete IO signal causes ISC CAM to direct products to the reject destination. Specify the reject destination on the **Settings** HMI page or with a PLC command. Reject signals take priority and work with both internal mode and external mode.

In this example, all products except rejected products are sent to destination 1. Rejected products are sent to destination 2. This example applies to both internal mode and external mode.

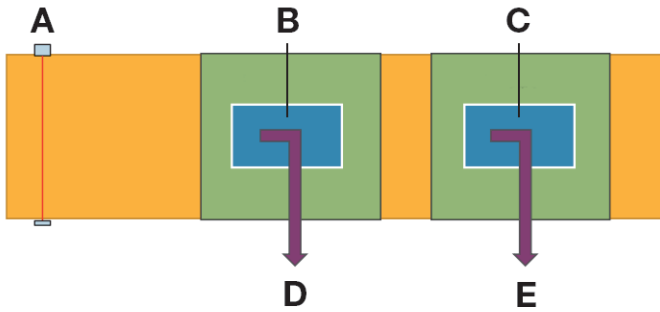


Figure 14: Reject destination on the Settings HMI page



- A reject signal
- B infeed PE signal
- C products block photoelectric sensor

Figure 15: Reject signal timing



- A infeed PE
- B product
- C rejected product
- D destination 1
- E destination 2 (reject)

Figure 16: Reject signal results

24-VDC DISCRETE IO CONNECTION PIN SETTING

The 24-VDC discrete IO connection allows a parent device to reject a product with a high speed signal. The connection also provides a fault signal to the parent device. See the ISC CAM 24-VDC Reject Connection Diagram on the ISC webpage (<https://intralox.com/isccam>) for reference. Wire the 24-VDC discrete IO connection as shown.

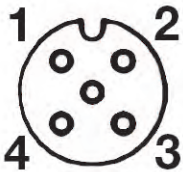


Figure 17: C3 Port pins for 24-VDC discrete IO connection

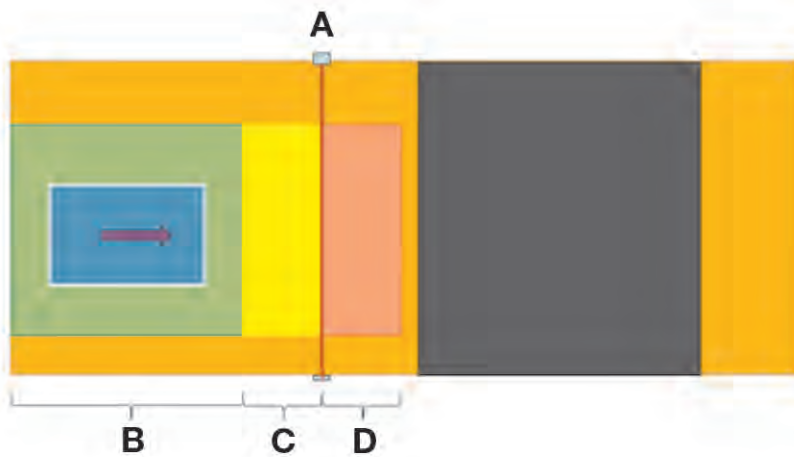
Pin Position	Function	Description	LED Condition
Pin 1	24-VDC power out (optional)	24-VDC power for (optional) relays	Not applicable
Pin 2	Run / Fault Output from the ISC CAM	Low (0V): Equipment is not running or one (1) or more faults are detected	LED 7 is off
		High (24-VDC): Equipment is running and no faults are detected	LED 7 is green
Pin 3	Ground		Not applicable
Pin 4	Reject Input to the ISC CAM	Low (0V): Divert products to destinations based on quantities (internal mode) or PLC signals (external mode)	LED 6 is off
		High (24-VDC): Divert products to the reject destination	LED 6 is green

ISC CAM C3 Interface: M12 female A-Coded, 18...30-VDC, 7 mA per input, max 0.5 A per output, unfused.

PRODUCT DESTINATION SIGNAL

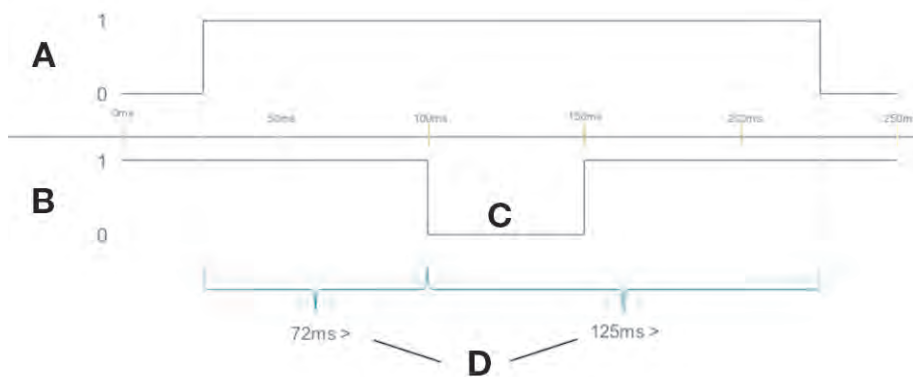
When operating in External Mode, the PLC, inspector, or other parent device sends a reject signal or product destination number to control each product destination. To ensure ISC CAM has time to direct the product to the correct destination, set this signal as soon as possible during the gap between products while the infeed PE is unblocked. The ISC CAM must receive the destination signal before the infeed PE detects the product leading edge. Set the signal for the next product the moment the previous product passes the infeed PE. The infeed PE signal status is included in the cyclic communication from ISC CAM to the PLC.

When a change of signal is received before the product leading edge reaches the infeed PE, but within the *PLC comm timing window* (listed on **Equipment HMI** page), a warning occurs (product destination signal received late). When a change of signal is received after the product leading edge reaches the infeed PE, a fault occurs (product destination signal received too late). Incorrect signal timing can cause incorrect destination assignment.



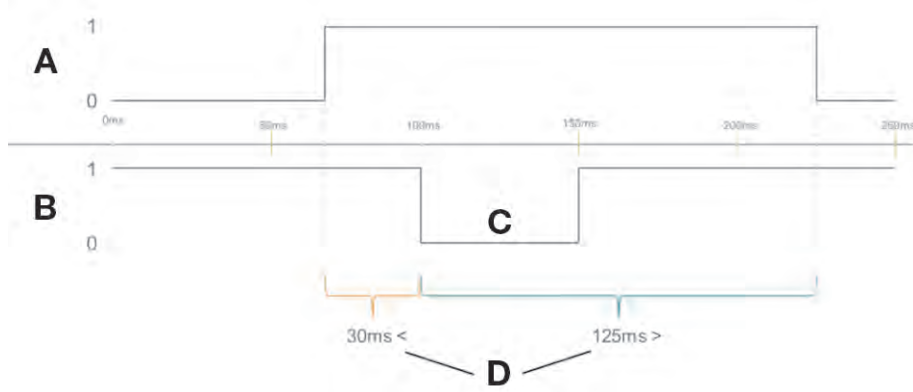
- A infeed PE
- B acceptable timing for destination signal
- C destination signal triggers warning
- D destination signal triggers fault

Figure 18: Product destination signal timing



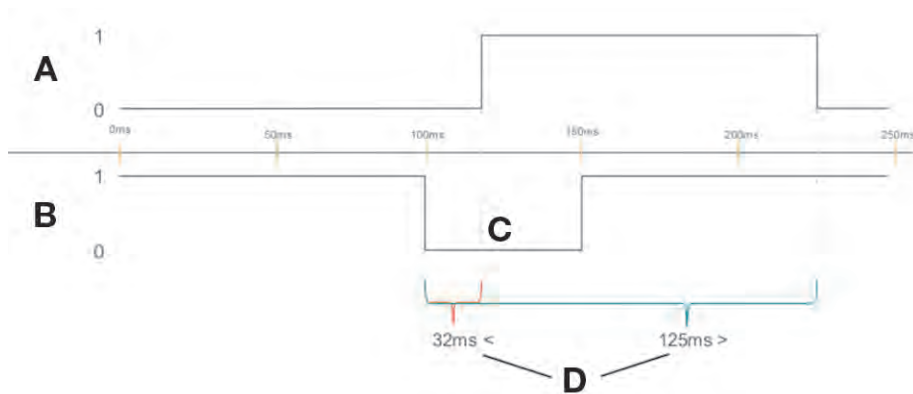
- A reject signal or product destination signal
- B infeed PE
- C product blocks photoelectric sensor
- D PLC communication window

Figure 19: Acceptable destination signal timing



- A reject signal or product destination signal
- B infeed PE signal
- C product blocks photoelectric sensor
- D PLC communication window

Figure 20: Destination signal timing triggers warning



- A reject signal or product destination signal
- B infeed PE signal
- C product blocks photoelectric sensor
- D PLC communication window

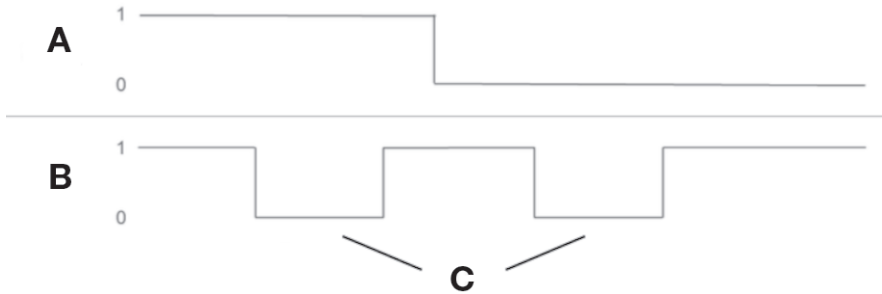
Figure 21: Destination signal timing triggers fault

DISABLE ACTIVE CARRYWAYS

Disable active carryways in the web-based HMI or use a PLC to write the parameter. For bi-directional belts, you can disable each carryway direction.

When a product is set to go to a disabled destination, it is reassigned to a destination further along the belt. If the reassignment destination is unavailable, the product is sent to the end-off.

This example applies to both internal mode and external mode. All products are set to go to destination 1. After product 1 is sent, the destination 1 carryway is disabled. Therefore, product 2 goes to the next destination, which is the end off.

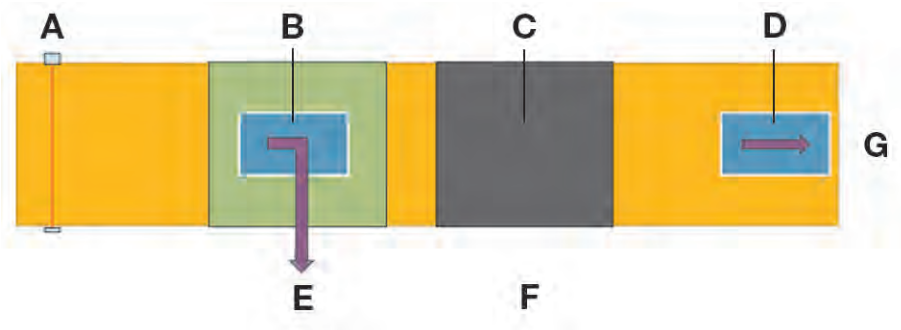


A destination 1 active carryway disabled

B infeed PE signal

C products block infeed PE

Figure 22: Disable carryway signal timing



A infeed PE

B product 1

C disabled active carryway

D product 2

E destination 1

F destination 2

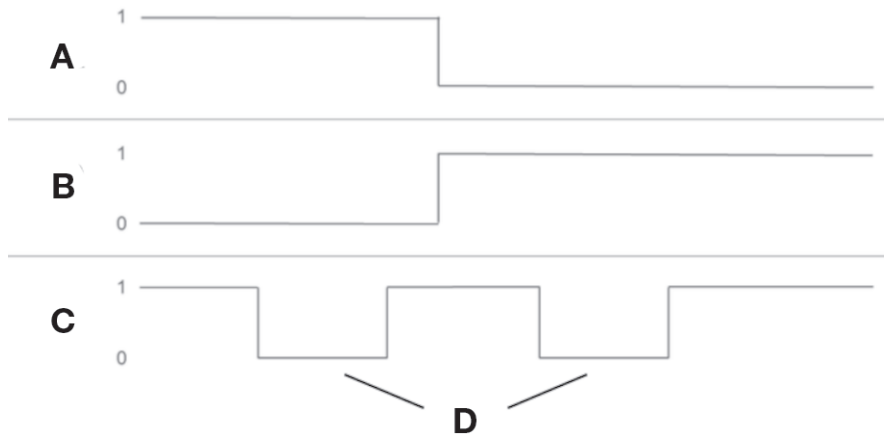
G destination 0/end off

Figure 23: Disable carryway signal results

MULTIPLE PRODUCT INFEEDS

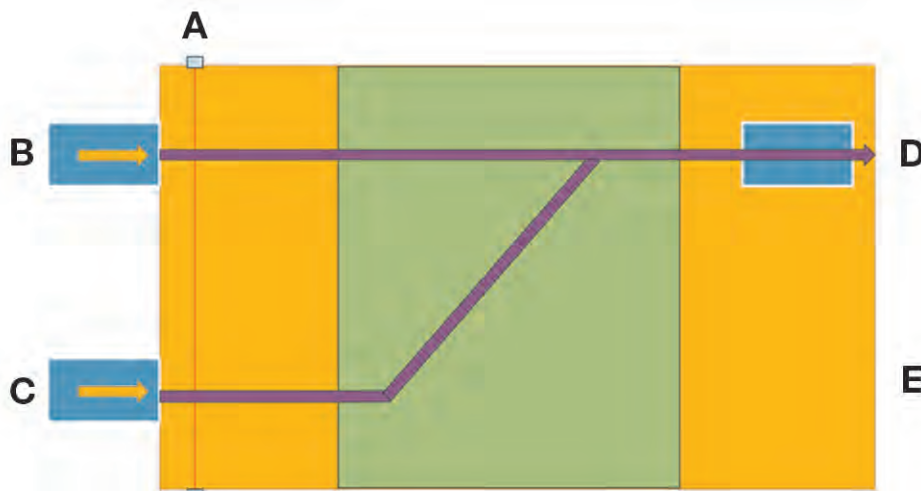
For applications with multiple infeeds, the PLC must signal which infeed is active. By default, although products come from multiple infeeds and take different paths, they all go to the same destinations.

In this example, all products, regardless of which infeed they come from, are sent to destination 1. This example applies to both internal mode and external mode



- A infeed 1 signal
- B infeed 2 signal
- C infeed PE signal
- D products block infeed PE

Figure 24: Dual infeed signal timing



- A infeed PE
- B infeed 1
- C infeed 2
- D destination 1
- E destination 2

Figure 25: Dual infeed signal results

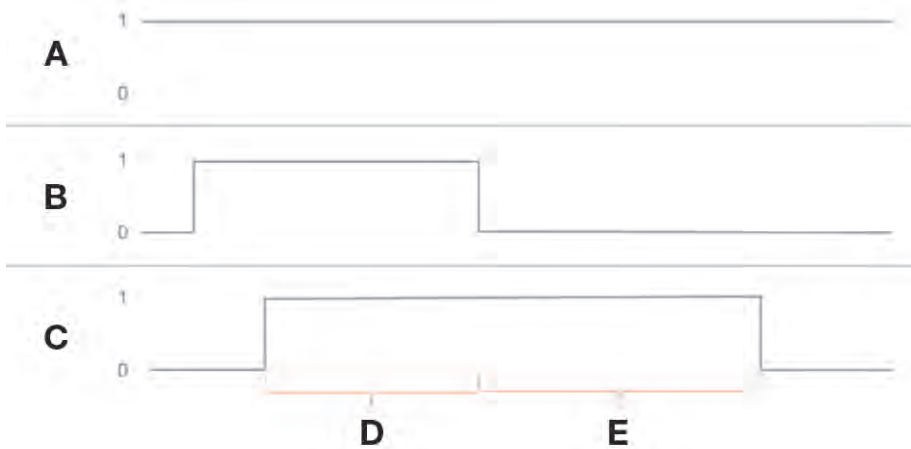
ACTIVE CARRYWAY VALVE OVERRIDE

For troubleshooting purposes, you can override the ISC CAM valve output with a PLC signal. For more information, see [Valve Override](#).

Three (3) parameters control the override:

- **Override active carryway pointer:** The carryway to override
- **Override active carryway value:** Whether the override enables or disables the active carryway
- **Enable override active carryway:** Whether the override is enabled or disabled

In this example (DARB S4500), an override turns active carryway 1 on. Next, an override turns active carryway 1 off. Finally, the override is deactivated.



A override carryway pointer signal **D** carryway 1 enabled with override
B active carryway value signal **E** carryway 1 disabled with override
C enable override signal

Figure 26: Active carryway override signal

PARAMETER COMMUNICATION

ISC CAM parameters are divided into parameter groups. Use the parameter group and parameter number to write and read parameters. The list of parameters and groups is in the Network Communication Data Interface document on the ISC webpage (<https://intralox.com/isccam>).

NOTE: Different parameters have different units. The ISC Network Communication Data Interface file explains how to convert parameter values.

PARAMETER WRITE OVERVIEW

The PLC writes parameters to the ISC CAM only on the rising edge of the write command, when the value changes from 0 to 1.

In this example, the PLC writes 1 to the **Reject destination** parameter. In the Network Communication Data Interface document, this parameter is number 121 in group 1.

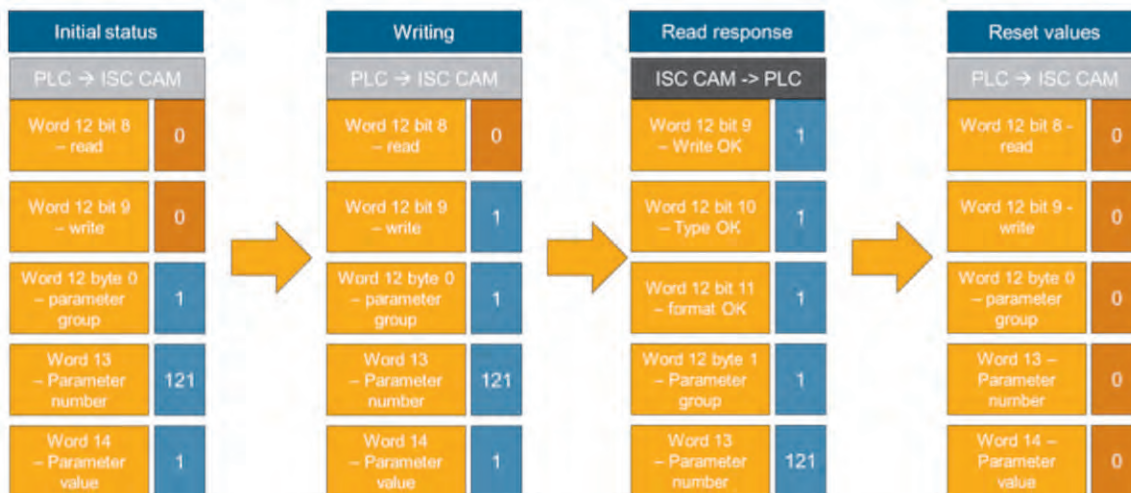


Figure 27: PLC writes reject destination parameter

Initial status: Set parameters with the write command set to false to ensure information is available when the write command turns to true.

Writing: The write command turns to true.

Read response: Check the response from the ISC CAM to confirm that the parameter was successfully written.

- **Write OK:** If the parameter was written, the value is 1.
- **Type OK:** If the parameter exists and is writeable, the value is 1.
- **Format OK:** If the parameter value is in the allowed range, the value is 1.
- **Parameter group:** Group of written parameter
 - Matches parameter group sent from PLC
- **Parameter number:** Parameter number written
 - Matches parameter number sent from PLC

Reset values: Reset all values after a response is received from the ISC CAM.

PARAMETER READ OVERVIEW

The PLC reads parameters from the ISC CAM only on the rising edge of the read command, when the value changes from 0 to 1.

In this example, the PLC reads the **Runtime counter** value. The Network Communication Data Interface document indicates that this is parameter 9 of group 6.

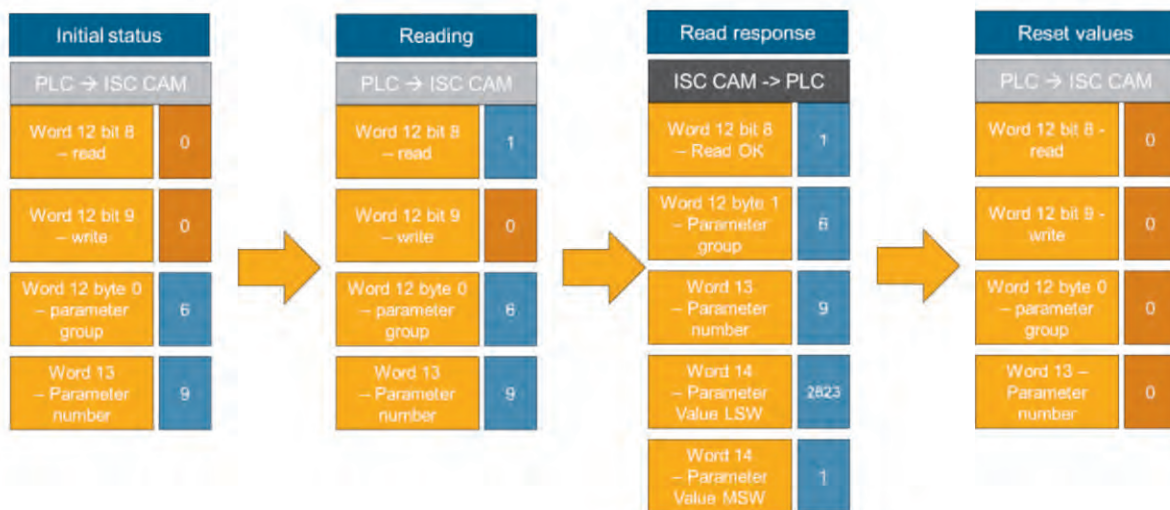


Figure 28: PLC reads the runtime counter parameter

Initial status: Set parameters with the read command set to false to ensure that information is available when the read command turns to true.

Reading: The read command turns to true.

Read response: Check the response from the ISC CAM to confirm that the parameter was successfully read.

- **Read OK:** If the parameter was read, the value is 1.
- **Parameter group:** The group of the parameter that was read
 - Matches the parameter group sent from the PLC
- **Parameter number:** The number of the parameter that was read
 - Matches the parameter number sent from the PLC

- **Parameter value LSW:** Least significant word for the value
 - Combines with the MSW
 - In this example, the LSW value is 2823.
- **Parameter value MSW:** Most significant word for the value
 - Combines with the LSW
 - In this example, the MSW 1 value equals 65536.
- **Total value: LSW + (MSW * 65536):**
 - In this example, the total value is $2823 + (1 * 65536) = 68359$.
 - The runtime value is converted: 1.024 seconds from the ISC CAM * 68359 total value = 7000 seconds.
 - The runtime value can be further converted to DD:HH:MM:SS format, in this case, 00:19:26:40.

Reset values: Reset all values after a response is received from the ISC CAM.

CONNECT AUXILIARY SENSORS TO PLC

To provide additional information to a line PLC, Intralox may install any of the following sensors on the equipment:

- Air Pressure Sensor
- Elongation Sensor for Powered Tight Transfer (PTT)
- Jam Sensor

These sensors integrate directly with a PLC and do not connect to the ISC CAM. Use the information in this section to wire and connect the sensors to a PLC, and configure logic for faults and warnings.

AIR PRESSURE SENSOR

An air pressure sensor monitors actuator air pressure. Low or high pressure can damage pneumatic components and affect performance.

JAM SENSOR

The jam sensor is a retroreflective sensor to detect jams or backups at the outfeed.

A jam is indicated when the sensor is blocked longer than the product length. Configure the sensor to operate in light operate mode with the PLC input scanning for a FALSE condition. Program the system to initiate an encoder counter when the sensor triggers a false state, incrementing the counter with each encoder pulse while the sensor is blocked. Set the jam detection threshold to 80 pulses, triggering a fault condition when this threshold is reached or exceeded. Adjust this threshold as needed for the application.

This configuration creates a fail-safe system that immediately detects problems such as damaged cables, disconnections, or defective sensors.

Alternatively, use a timer to detect the jam instead of an encoder pulse threshold. The encoder pulse method is recommended as a timer does not consider belt speed.

BELT ELONGATION SENSOR FOR POWERED TIGHT TRANSFER (PTT)

The belt elongation sensor is a through-beam photoelectric sensor with an emitter and a receiver. The sensor pair detects excessive belt elongation for Powered Tight Transfer (PTT) applications. If the belt elongates beyond the acceptable wear limit, the sensor beam is blocked. Program the PLC to trigger a fault when the sensor beam is blocked. If the fault occurs, check the PTT belt for elongation according to your equipment user manual.

INTEGRATE WITH TIA PORTAL

Use the GSD file and PLC tag library from the ISC webpage (<https://intralox.com/isccam>) to integrate the ISC CAM with TIA Portal and add the ISC CAM to network view.

Follow the instructions in this section to integrate with TIA Portal.

DOWNLOAD TIA INTEGRATION SUPPORT FILES

1. Download the **ISC CAM Network Integration Support Files** from the ISC webpage (<https://intralox.com/isccam>).
2. Unzip the folder.
3. Locate the two (2) files used for TIA integration:
 - **GSDML-INTRALOX-ISC-CAM-V2.xml**: GSD file
 - **TIA_LIBRARY_15.1_ISC_CAM_v2**: PLC tag library

ADD GSD FILE TO TIA PORTAL PROJECT

Add the downloaded GSD file to your TIA Portal Project.

1. Open the TIA Portal application.
2. Click to open the **Options** menu then click **Manage general station description files (GSD)**.

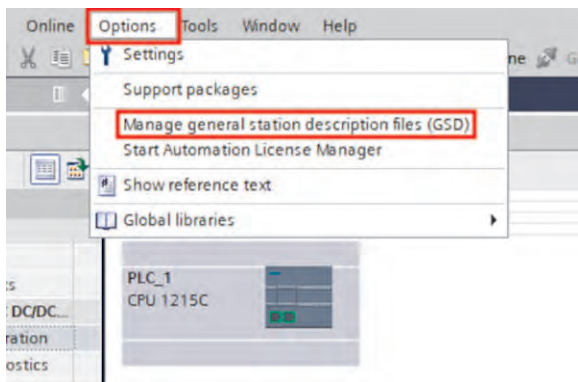


Figure 29: Manage GSD files

3. Click the ellipsis to choose a folder of GSD files to install.

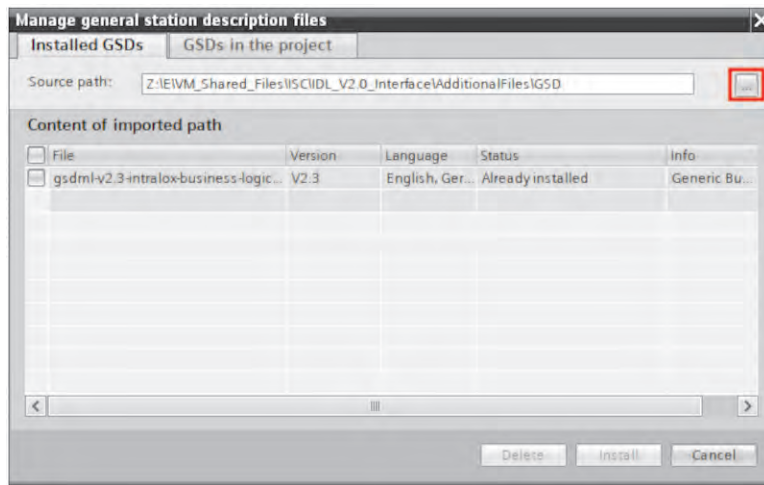


Figure 30: Click ellipsis

4. Browse to then select the folder of ISC CAM GSD files. See [Download TIA Integration Support Files](#) for more information.

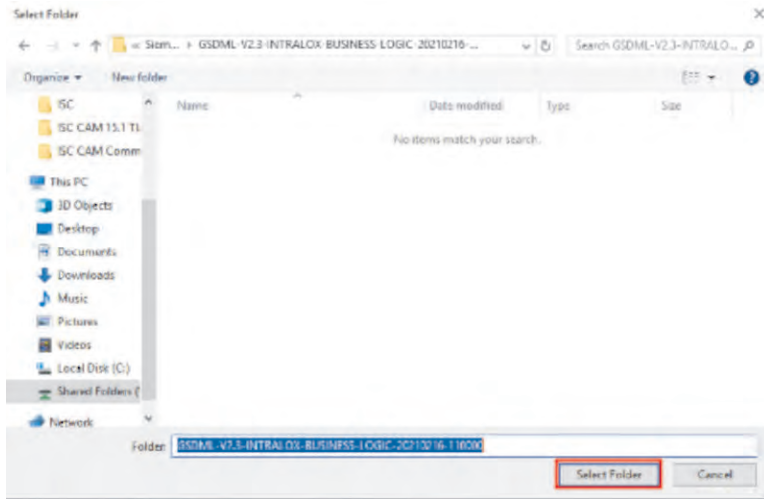


Figure 31: Select the GSD folder

5. Check the box to select the ISC CAM GSD file then click **Install**.

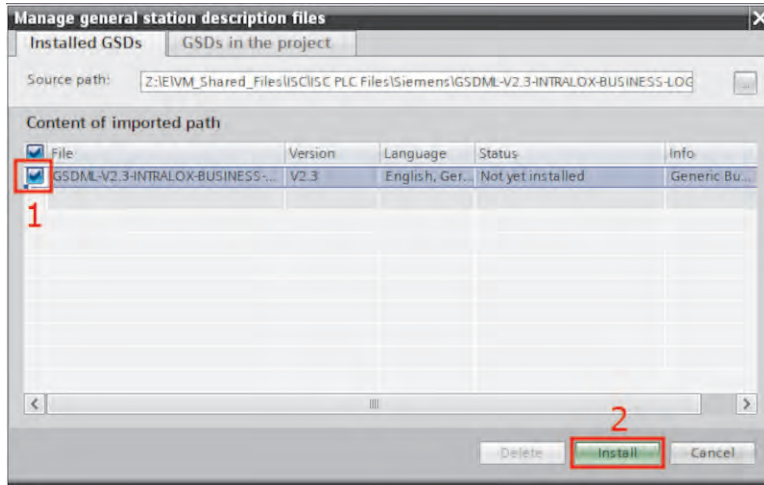


Figure 32: Select ISC CAM GSD file

6. After the installation completes, click **Close**.

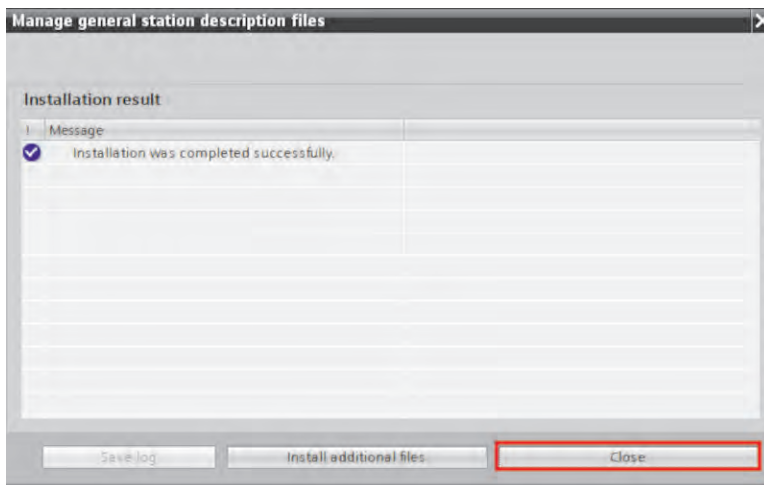


Figure 33: Installation complete

ADD ISC CAM TO NETWORK VIEW

1. Under **Devices**, select **Device configuration** then click **Network view**.

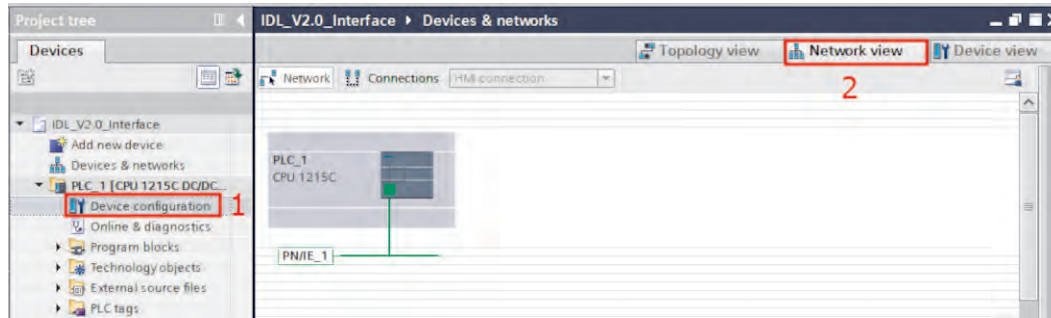
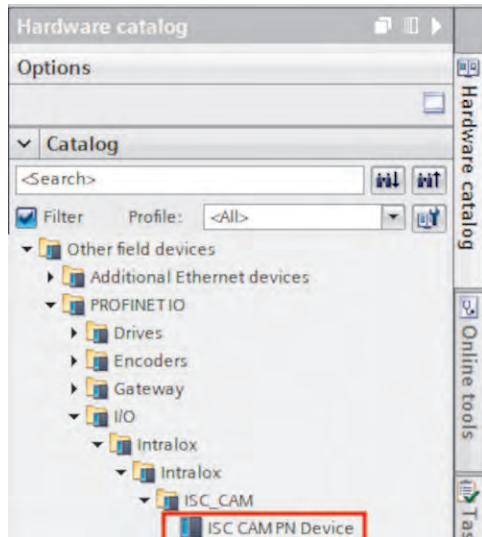


Figure 34: Network view

2. Open the **Hardware catalog**.
3. To locate ISC CAM in the catalog, click the arrow to expand **Other field devices**, followed by **Other field devices > Profinet IO > I/O > Intralox > Intralox > ISC_CAM**.



4. Click and drag the **ISC CAM PN Device** from the **Hardware catalog** to the **Network view**.
5. In the network view, click **Not assigned** on the ISC CAM PN Device then click to select the IO controller to connect to the ISC CAM.

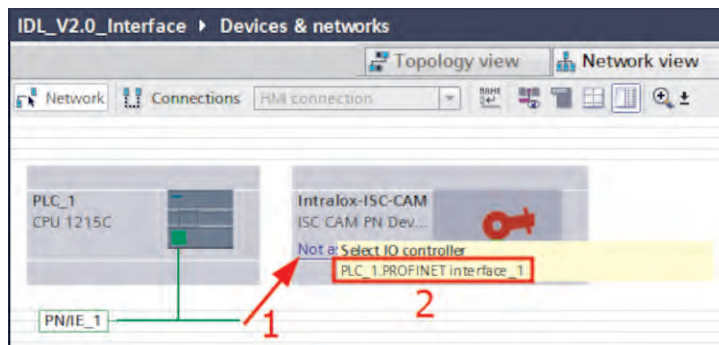
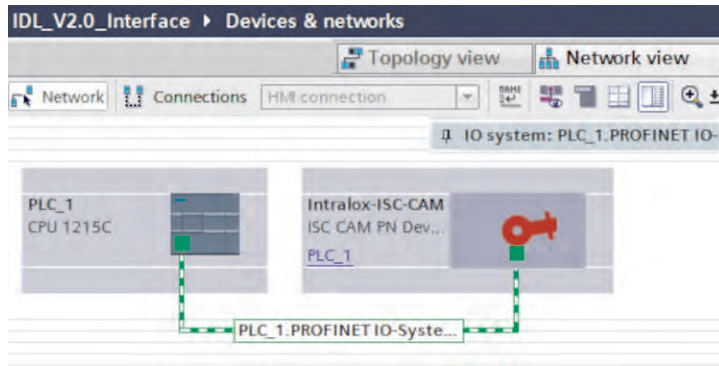


Figure 35: Connect PLC to ISC CAM in network view

The IO controller connects to the ISC CAM.



CONFIGURE ISC CAM CONNECTION

1. In the TIA Portal application, click the arrow to expand the **Online access** tree in the **Project tree**.

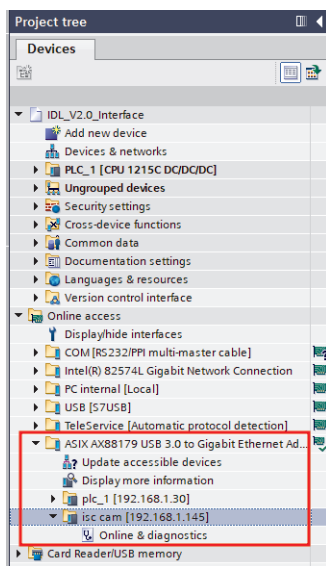


Figure 36: Ethernet adapter and ISC CAM in Online access tree

2. Click the arrow to expand the ethernet adapter connected to the ISC CAM device.
3. Expand the ISC CAM tree then click **Online & diagnostics**.
4. Assign a device IP address.

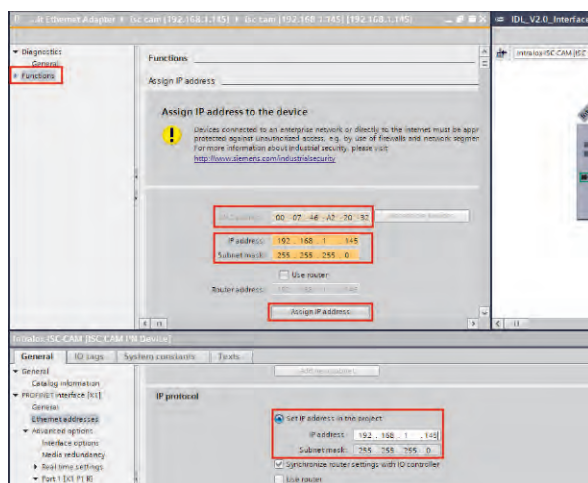


Figure 37: Assign IP address and subnet mask

- a. Click **Functions** in the left sidebar.
 - b. Verify the MAC address matches the ISC CAM listed in the Intralox Service Tool.
 - c. Enter the project IP address and subnet mask.
 - d. Click **Assign IP address**.
5. Scroll down to **Assign PROFINET device name** then enter the project PROFINET name.

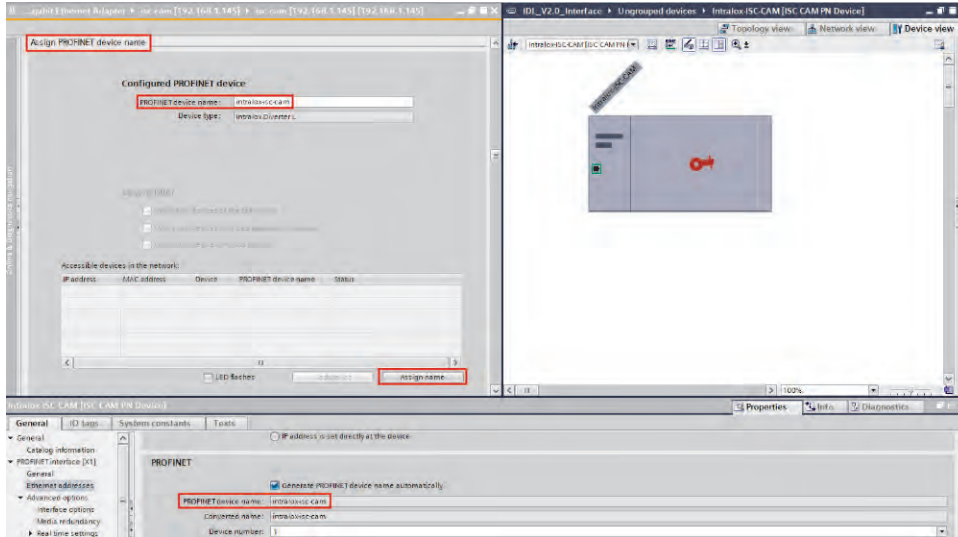


Figure 38: Assign PROFINET device name

6. Click **Assign Name**.

ADD PLC TAGS TO PROJECT

1. Import the library file. Choose **Libraries** from the right-hand column.

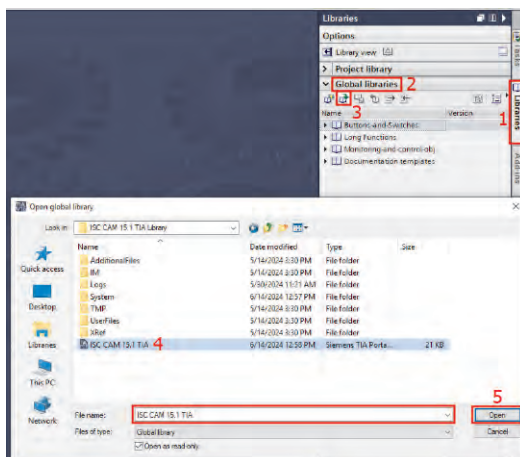


Figure 39: Import ISC CAM library file to TIA Portal

- a. Click **Libraries** to open the sidebar.
- b. Click **Global libraries**.
- c. Click the **Open global library** icon.
- d. Select the TIA library file (TIA_LIBRARY_15.1_ISC_CAM_v2) and click **Open**. See [Download TIA Integration Support Files](#) for more information.

- If the TIA Portal project version is newer than 15.1, upgrade the library when the prompt appears. Select a product and click **Upgrade**.

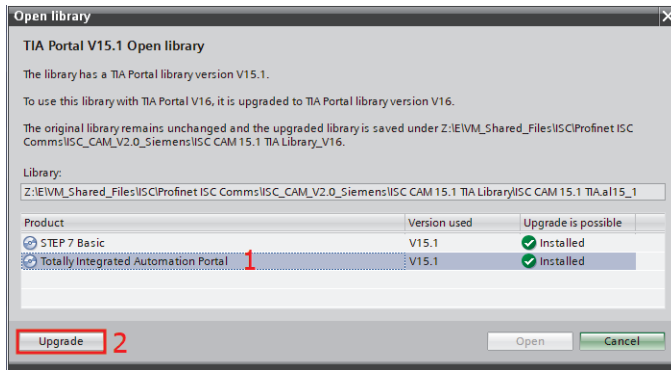


Figure 40: Upgrade library

- Add the ISC CAM tags from the library to the PLC.

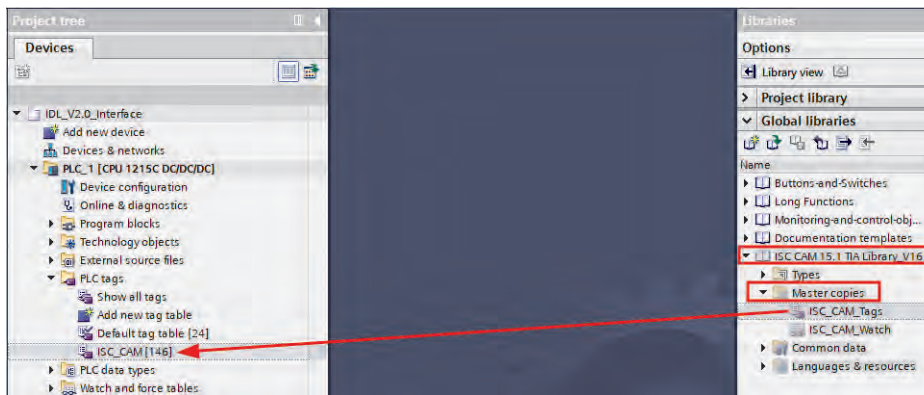


Figure 41: Add tags from the ISC CAM library to the project

- Under **Global libraries**, click the arrow to expand the TIA_LIBRARY_15.1_ISC_CAM_v2 library.
- Click the arrow to expand **Master copies**.
- Click and drag **ISC_CAM_Tags** into the project **PLC tags**.
- If an ISC CAM device was previously added to the project, a conflict prompt appears. Click **Rename and paste objects** then click **OK**.

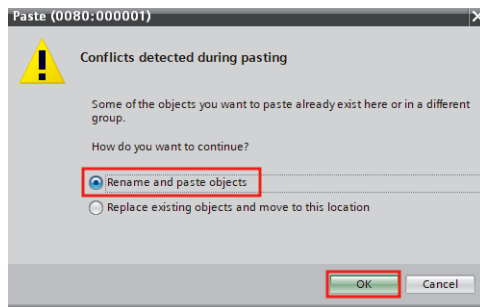


Figure 42: Paste conflict

- Repeat steps 1-3 to add additional ISC CAM devices to the project.

CONFIGURE INPUT AND OUTPUT SIZE

1. Click **Device configuration** in the project tree.

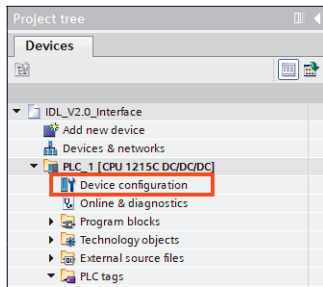


Figure 43: Device configuration

2. Click the drop-down then select **ISC CAM**.



Figure 44: Select ISC CAM device view

3. Click and drag the divider to expand the **Device overview** pane on the right.
4. In the **Hardware catalog**, click the arrow to expand the **Module** tree.

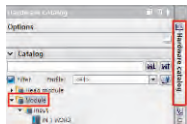


Figure 45: Module tree in Hardware catalog

5. Drag and drop **IN 16 WORD** from the **Hardware catalog** to slot 1 in the **Device overview**. Drag and drop **OUT 16 WORD** to slot 2.

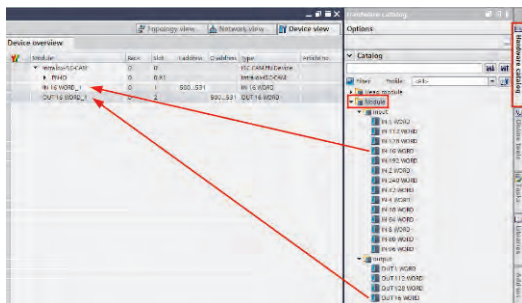


Figure 46: Drag and drop IN 16 WORD and OUT 16 WORD

SET UP INPUT AND OUTPUT ADDRESS

The library file address for PLC tags is **input 500-531** and **output 500-531**. If that range is available, complete only step 1 of the procedure. If the 500...531 range is occupied, skip step 1.

1. If the 500...531 range is unoccupied, configure that range for the ISC CAM I address and Q address. Skip all other steps in the procedure.

Device overview					
Module	Rack	Slot	I address	Q address	Type
Intralox-ISC-CAM	0	0			ISC C...
PN-HO	0	0 X1			Intrak...
IN 16 WORD_1	0	1	500...531		IN 16...
OUT 16 WORD_1	0	2		500...531	OUT 1...

Figure 47: Configure I address and Q address ranges

- a. In the **Device overview**, double-click the **I address** field, type 500 and press enter. The value in the field for ISC CAM changes to 500...531.

3 PLC INTEGRATION

b. Repeat for the **Q** address field.

2. If the 500...531 range is occupied, click the arrow to expand **PLC tags** in the project tree and click **ISC CAM**.

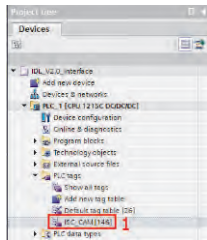


Figure 48: ISC CAM PLC tags

3. Click the **Address** column header to sort the bytes by address.

4. Select the first input byte **i_NotUsed** address (%IB500) and change it to match the first byte of the available **I** address of the ISC CAM listed in **Device overview**.

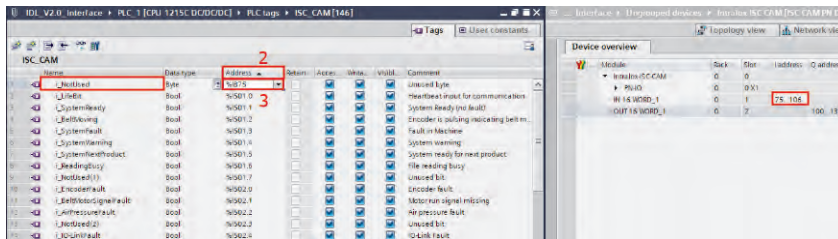


Figure 49: Change first input tag address to match ISC CAM

5. Hover the mouse over the bottom-right corner of the edited address field. When the pointer changes to a **+** icon, click and drag down until the last input word (**i_ParameterValueMSW**) to fill the input address fields with the ISC CAM device values.

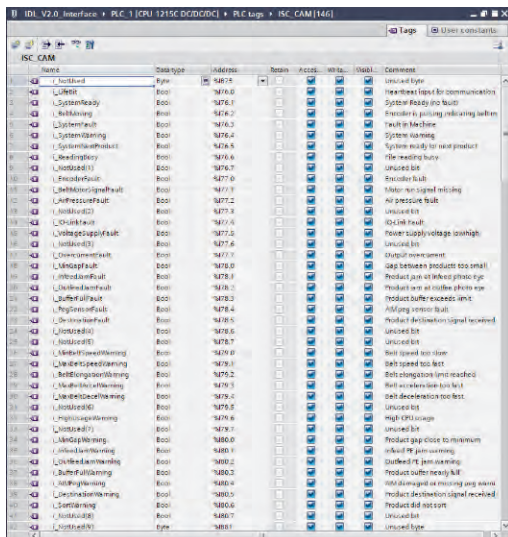


Figure 50: Fill input tag addresses with ISC CAM values

6. Click to select **Overwrite tags** then click **OK**.

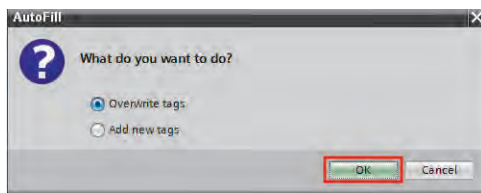
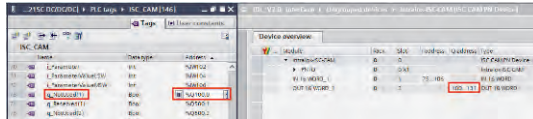


Figure 51: Autofill prompt

7. Verify the address range of the input tags is within the ISC CAM **I address** range.
8. If the output address range is used in the project, complete the following steps to map output PLC tags and ISC CAM device output. If the output address range is not used in the project, skip the remaining steps in this procedure.
9. Change the first output PLC tag **q_NotUsed(1)** “%Q500.0 to match the first **Q address**.

Figure 52: Change first output tag address to match ISC CAM



10. Select the first output byte **q_NotUsed** address (%Q500) and change it to match the first byte of the available **Q address** of the ISC CAM listed in **Device overview**.
11. Hover the mouse over the bottom-right corner of the edited address field. When the pointer changes to a **+** icon, click and drag down until the last output word (**q_NotUsed(36)**) to fill the output address fields with the ISC CAM device values.

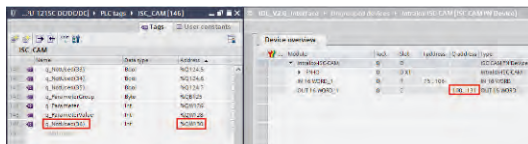


Figure 53: Fill output tag addresses with ISC CAM values

12. Hover the pointer over the bottom-right corner of the edited address field. When the pointer changes to a **+** icon, click and drag down until the last output word (**q_NotUsed(36)**) to fill all **Address** fields with the ISC CAM device values.
13. Click to select **Overwrite tags** then click **OK**.

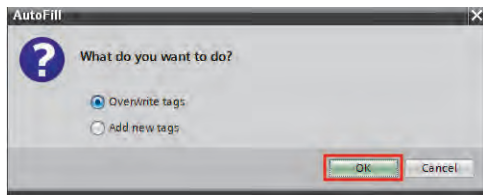


Figure 54: Autofill prompt

INTEGRATE WITH ROCKWELL STUDIO 5000

To integrate ISC CAM with a Rockwell PLC using Generic Ethernet Device (GED) files, follow these procedures. To integrate ISC CAM with a Rockwell PLC using an Electronic Data Sheet (EDS) file, see [Integrate with Electronic Data Sheet](#).

DOWNLOAD GED FILES

1. Download the **ISC CAM Network Integration Support Files** from the ISC webpage (<https://intraox.com/isccam>).
2. Unzip the folder.

3. Locate the six (6) files used for GED integration:

- **GED_ISC_CAM_v2.L5K**: Generic Ethernet Device for ISC CAM
- **AOI_ISC_CAM_v2_INPUTS.L5K**: AOI to convert data for inputs which do not fit the INT data format of the GED
- **AOI_ISC_CAM_v2_OUTPUTS.L5K**: AOI to convert data for output which does not fit the INT data format of the GED
- **UDT_ISC_InDataConversion.L5K**: data type to match AOI inputs
- **UDT_ISC_OutDataConversion.L5K**: data type to match AOI outputs
- **EXAMPLE_ISC_CAM_v2_COMM_ETHERNETIP.ACD**: example program that includes all other files

IMPORT THE GED TO A STUDIO 5000 PROJECT

1. In Rockwell Studio 5000, open the **Controller Organizer**.
2. Locate the PLC for ISC CAM connection, expand the PLC node, and right-click **Ethernet**.
3. Select **Import Module**.

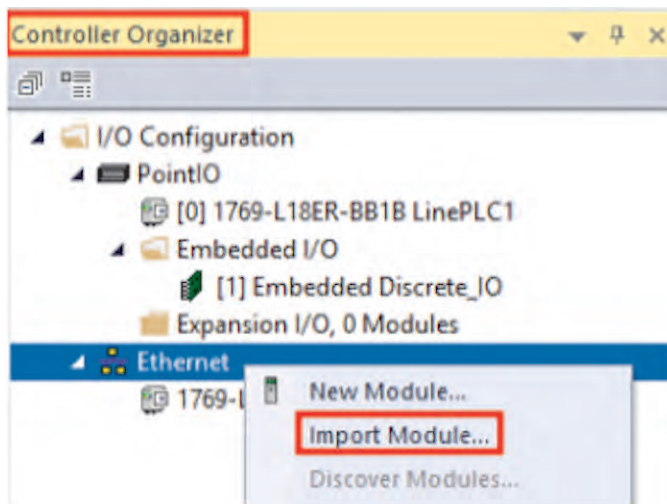


Figure 55: Import module

4. In the dialog box that appears, select the **GED_ISC_CAM_v2.L5K** file and click **Open**.

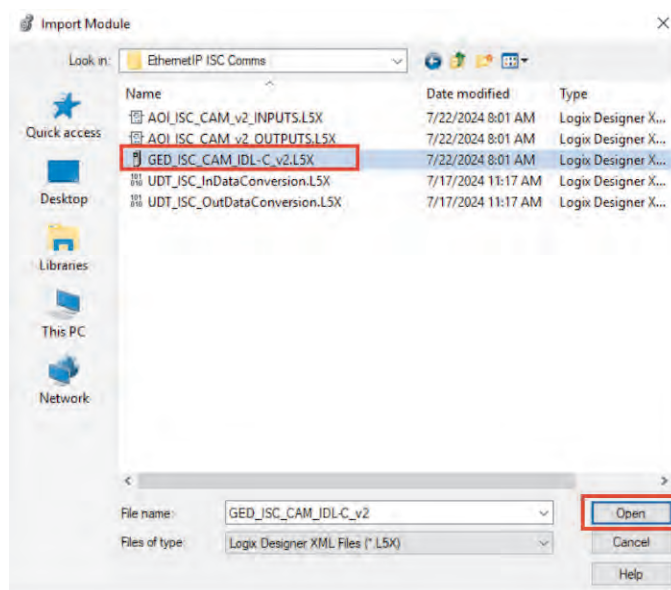


Figure 56: Select the module file

3 PLC INTEGRATION

- The **Import Configuration – GED_ISC_CAM_v2.L5K** dialog box appears. If desired, update the **Final Name** and **Description** fields.

NOTE: If the project includes more than one ISC CAM module, the **Final Name** must be unique.

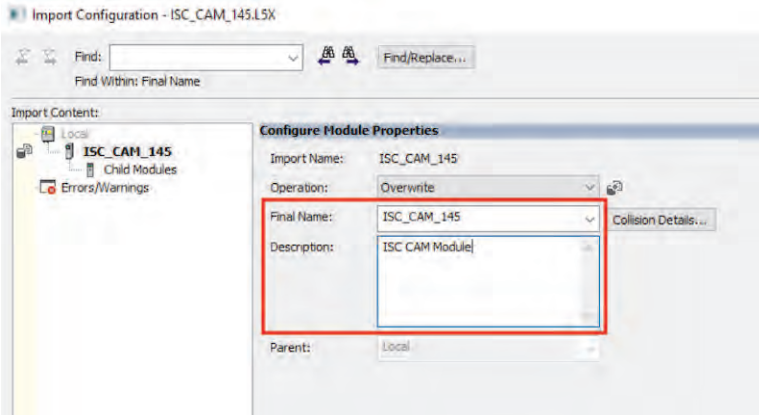


Figure 57: Configure ISC CAM module name and description

- Click **OK**.
The GED is imported.
- Verify tags and descriptions were added to the program.

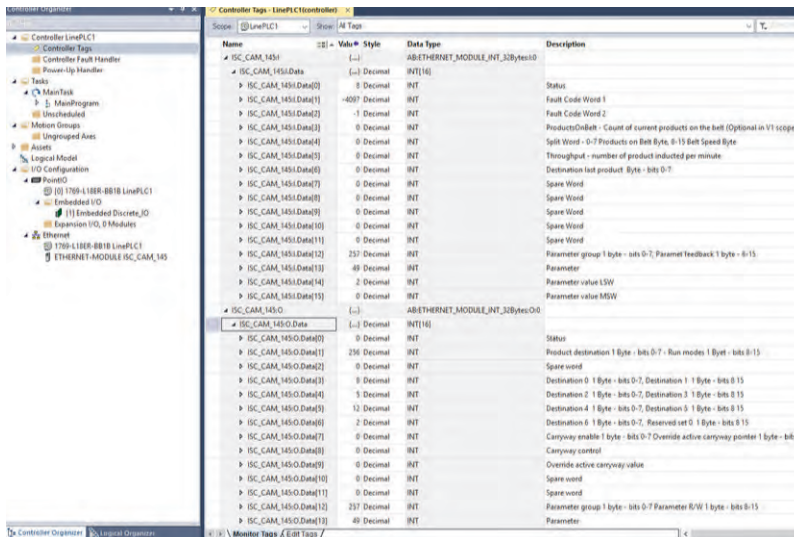


Figure 58: Tags and descriptions added

IMPORT ADD-ON INSTRUCTION

- In Controller Organizer, click the arrow to expand the **Assets** folder.
- Right-click **Add-On Instructions** and select **Import Add-On Instruction...**

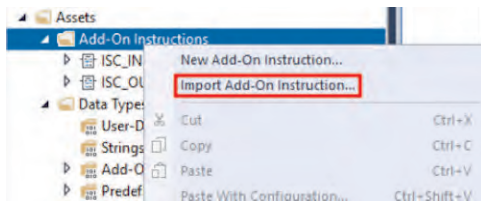


Figure 59: Import Add-On Instruction

3. Select the **AOI_ISC_CAM_v2_INPUTS.L5K** file and click **Open**.

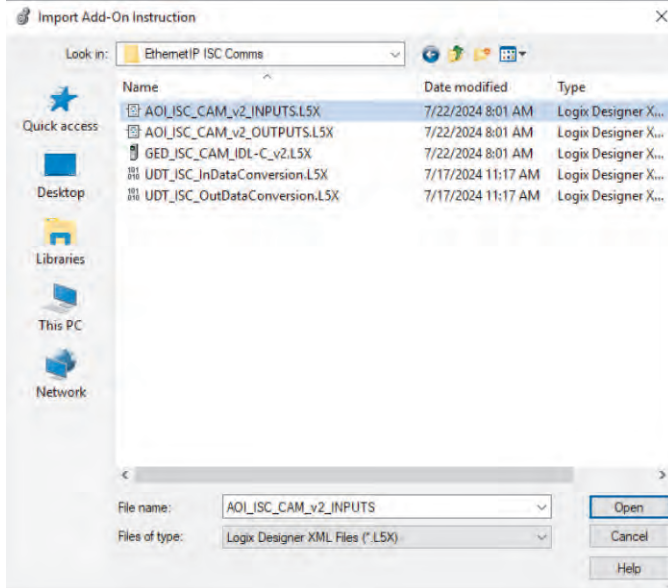


Figure 60: Select input data Add-On Instruction file

4. The **Import Configuration – AOI_ISC_CAM_v2_INPUTS** dialog box appears. Click **OK** to import the input data Add-On Instruction.

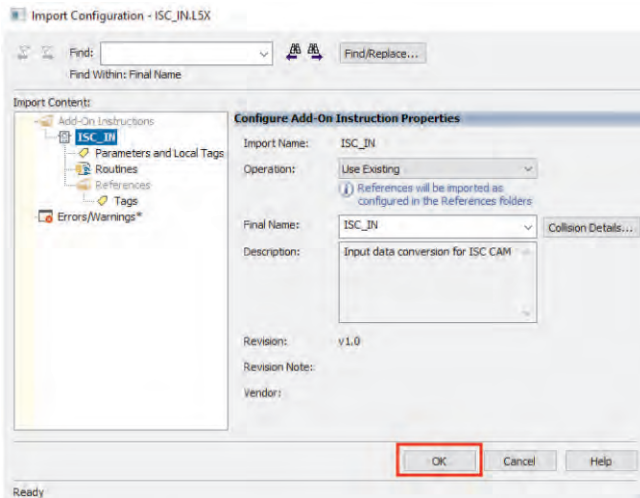


Figure 61: Import input data Add-On Instruction

5. Repeat steps 1–4 to import the **AOI_ISC_CAM_v2_OUTPUTS.L5K** file.

ADD INPUT AOI

1. Drag and drop the imported **AOI_ISC_CAM_v2_INPUTS** to a rung in the program.
2. Double-click the **AOI_ISC_CAM_v2_INPUTS** field.
3. In the **Data Type** field, enter a unique name.

- Right-click the data type name and select **New xyz**.
The Data Type value will be **AOI_ISC_CAM_v2_INPUTS**, which matches the AOI.

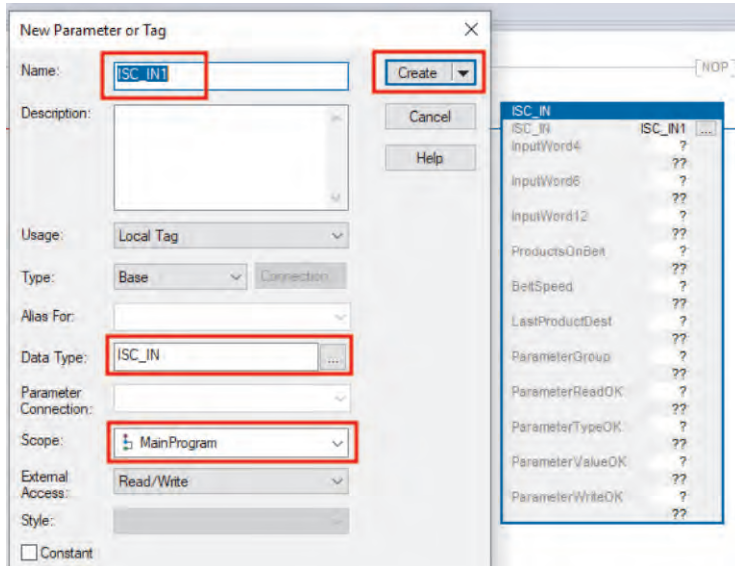


Figure 62: Add input AOI

- Verify the scope of the program is correct and click **Create**.
- Add the ISC CAM Module input words that correspond to the AOI.

NOTE: Intralox provided User-Defined Data Types (UDT) can be used for this step. See [Add User-Defined Data Types \(UDT\)](#) for additional information.

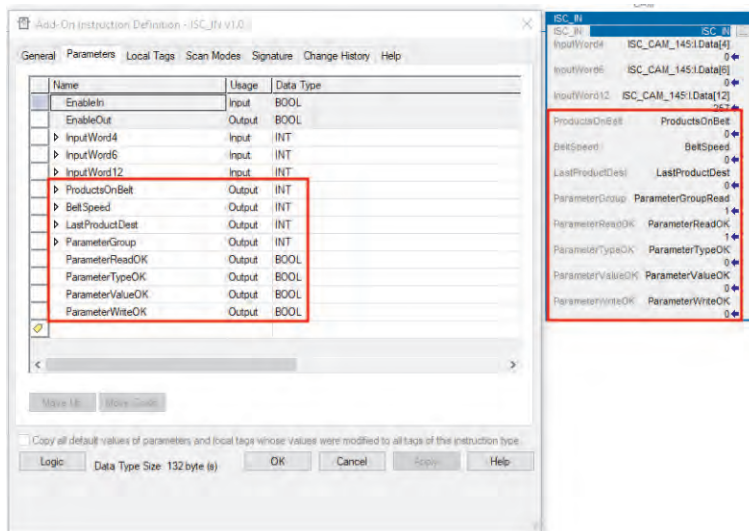


Figure 63: Add input words that correspond to the AOI

- Create unique data types for the next four (4) AOI output items of type INT.
- Create unique data types for the next four (4) AOI output items of type BOOL.
- Click **OK**.

ADD OUTPUT AOI

- Drag and drop the imported AOI_ISC_CAM_v2_OUTPUTS to a rung in the program.
- Double-click the **AOI_ISC_CAM_v2_OUTPUTS** field.
- In the **Data Type** field, enter a unique name.

4. Right-click the data type name and select **New xyz**.
The Data Type value will be **AOI_ISC_CAM_v2_OUTPUTS**, which matches the AOI.
5. Verify the scope of the program is correct and click **Create**.
6. Add the ISC CAM Module output words that correspond to the AOI.

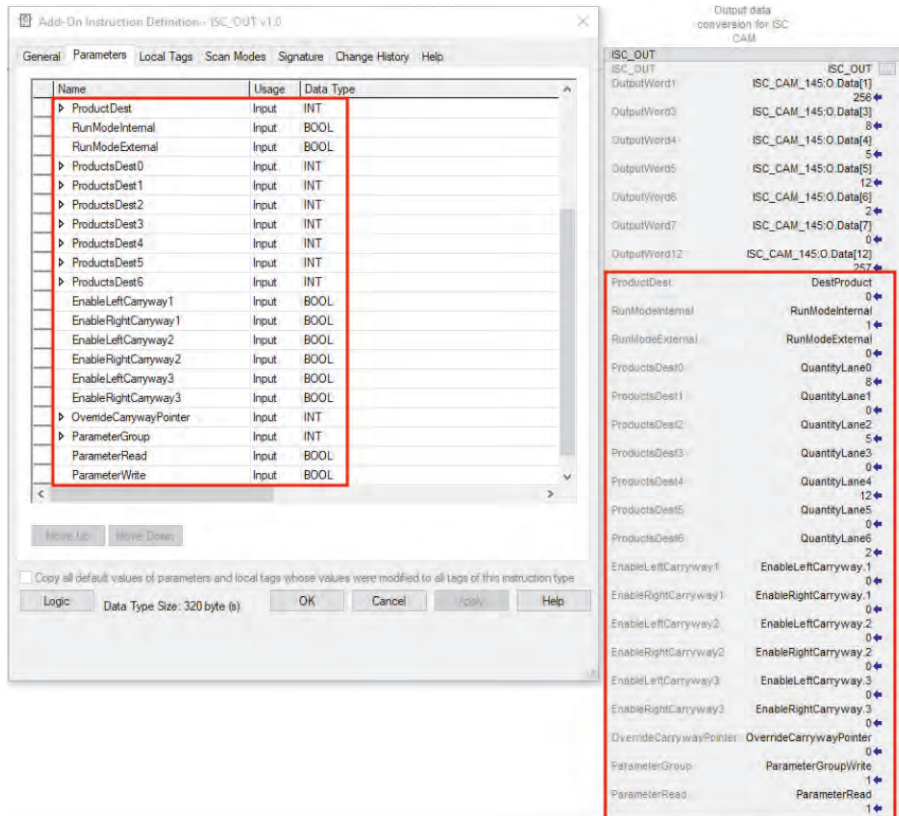


Figure 64: Add output words that correspond to the AOI

7. Create unique data type names for all parameters in AOI_ISC_CAM_v2_OUTPUTS.
8. Click **OK**.

ADD USER-DEFINED DATA TYPES (UDTs) FOR AOIS

1. In Controller Organizer, navigate to **Assets > Data Types**.
2. Right-click **User-Defined** and select **Import Data Type**.

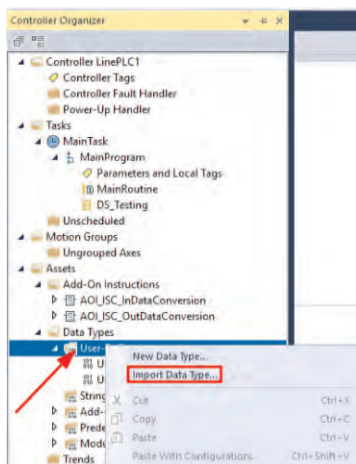


Figure 65: Select Import Data Type...

3. Select the **UDT_ISC_InDataConversion.L5X** file and click **Open**.

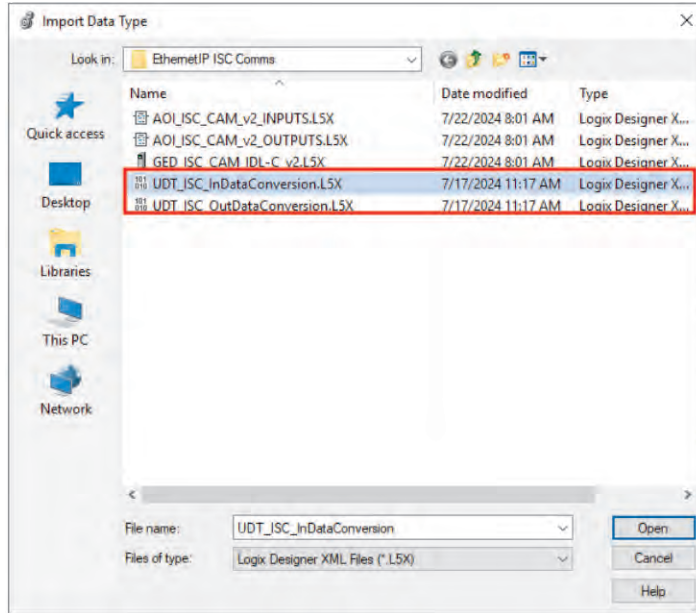


Figure 66: Select InDataConversion L5X file

4. Repeat steps 2-3 to import **UDT_ISC_OutDataConversion.L5X**.
An input and output data type can be added to the program scope that includes the AOIs.
5. Verify the imported data types match the AOI parameters.

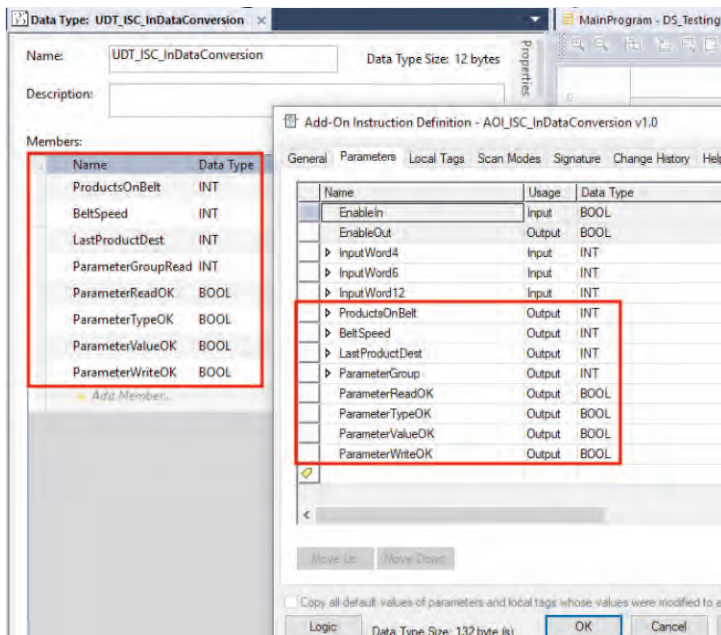


Figure 67: Verify the imported data types match AOI parameters

INTEGRATE WITH ELECTRONIC DATA SHEET

1. Download the **ISC CAM Network Integration Support Files** folder from <https://www.intralox.com/isccam>.
2. Within the folder of support files, find the electronic data sheet for ISC CAM, **EDS_ISC_CAM_v2.EDS**, and import it into your programming environment.
3. Add and configure the module.

- a. Use the ISC Service Tool to set up the IP address. See [Configure Network with Service Tool](#) for more information.
 - b. Assign a device name.
 - c. **Disable keying.**
4. Verify the configuration.
If configured correctly, the ISC CAM module is listed in the programming environment and the device is available in the Ethernet tree.

4 USE INTERNAL MODE WITHOUT A PLC

To use ISC CAM without a PLC, follow this procedure to select Internal Mode and specify the quantity of products to direct to each destination on the **Settings** HMI page. If using ISC CAM with a PLC, integrate with the PLC and set the run mode and destinations with PLC commands. See [PLC Integration](#) for more information.

1. On the **Settings** HMI page, in the Application Settings section, set the run mode to Internal.

Application Settings




Run mode Internal ▾

Figure 68: Internal run mode

NOTE: If the ISC is connected to a PLC, you cannot select the run mode from the HMI. Settings from a PLC overwrite the setting in the web-based HMI. Set the run mode with a PLC command. See [PLC Integration](#) for more information.

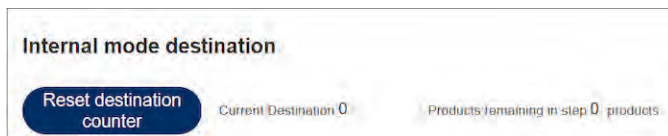
2. In the Internal mode destination section, specify the quantity of products to direct to each destination.



Destination 1 max: 255 min: 0 Destination 2 max: 255 min: 0 Destination 3 max: 255 min: 0

Figure 69: Destination settings for internal mode

3. Click **Submit** to save the destination settings.
4. Click **Reset destination counter**.



Internal mode destination

Reset destination counter Current Destination 0 Products remaining in step 0, products

Figure 70: Reset destination counter

The ISC CAM applies the settings and sends the first product to the first configured destination.

NOTE:

- If you change destination settings and click **Submit** but do not click **Reset destination counter**, the ISC CAM finishes the current internal count cycle completely before using the new settings.
- If you change destination settings and click **Reset destination counter** without first clicking **Submit**, the changes are submitted and the destination counter is reset.

5 TEST EQUIPMENT WITH PRODUCTS

After the ISC CAM is integrated with a PLC or configured to use internal mode without a PLC, run a test with products. Assess if product trajectories must be adjusted or optimized.

NOTE: Ensure equipment is properly installed. Improperly leveled equipment may cause incorrect product movement or uneven belt wear.

1. Access the HMI and ensure there are no active faults or warnings.
If faults or warnings occur, see the ISC CAM Troubleshooting Guide for more information.
2. If the ISC CAM is integrated with a PLC, on the **IO-COMM** HMI page, verify that the words sent between the ISC CAM and the PLC match.

PLC communication

Life bit	Destination update Pre PE	Destination update Post PE					
☉	811 ms	0 ms					
Communication from ISC CAM to PLC							
Word out 0	24 0x0018	Word out 4	13 0x0000	Word out 8	0 0x0000	Word out 12	0 0x0000
Word out 1	65527 0xFFFF7	Word out 5	0 0x0000	Word out 9	0 0x0000	Word out 13	0 0x0000
Word out 2	65527 0xFFFF7	Word out 6	2 0x0002	Word out 10	0 0x0000	Word out 14	0 0x0000
Word out 3	0 0x0000	Word out 7	0 0x0000	Word out 11	0 0x0000	Word out 15	0 0x0000
Communication from PLC to ISC CAM							
Word in 0	0 0x0000	Word in 4	0 0x0000	Word in 8	0 0x0000	Word in 12	0 0x0000
Word in 1	0 0x0000	Word in 5	0 0x0000	Word in 9	0 0x0000	Word in 13	0 0x0000
Word in 2	0 0x0000	Word in 6	0 0x0000	Word in 10	0 0x0000	Word in 14	0 0x0000
Word in 3	0 0x0000	Word in 7	0 0x0000	Word in 11	0 0x0000	Word in 15	0 0x0000

Figure 71: IO-COMM page, PLC communication section

3. Run the equipment with products and verify that the equipment performs as required.
 - If product trajectory issues occur, adjust parameters on the **Settings** HMI page. See [Adjust Trajectories and Recipes](#) for more information.
 - If faults appear in the HMI, see the ISC CAM Troubleshooting Guide.

For more information, see the Application Functional Layout.

6 ADJUST TRAJECTORIES AND RECIPES

If products do not properly travel to the assigned destinations, adjust the trajectory parameters on the **Settings** HMI page. Different trajectory parameters are available to optimize performance depending on the equipment technology.

- **AIM:** Product Nose and Tail, Activation and Deactivation Delay
- **DARB:** Product Tracking Point, Divert Trigger Point, Divert Distance Dwell
- **ARB S7000/S7050:** Product Tracking Point
 - **Sorter only:** Divert Trigger Point, Divert Distance Dwell
 - **Switch only:** Trigger Point

Save and recall frequently used trajectory parameter settings as "recipes."

AIM: OPTIMIZE PEG ACTIVATION

Adjust the **product nose and tail** and **activation and deactivation delay** to optimize peg activation. These settings are only available on AIM equipment.

PRODUCT NOSE AND TAIL

Adjust product nose and tail to add pegs before and after the product. Use these settings to optimize product divert action.

Set product nose to add pegs in front of the product. Set product tail to add pegs behind the product.

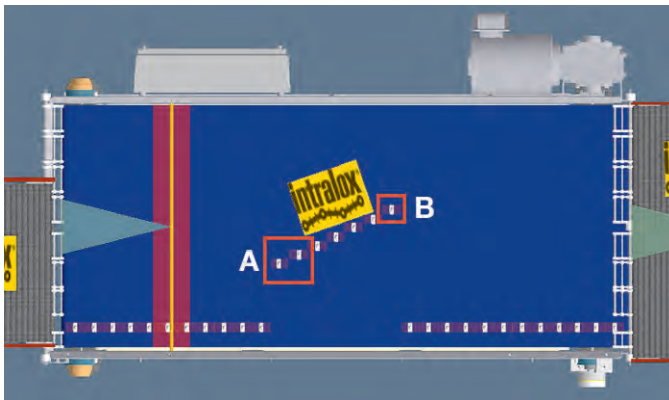


Figure 72: Product nose and tail

- A: product tail value two (2)
- B: product nose value one (1)

ACTIVATION AND DEACTIVATION DELAY

Adjust activation and deactivation delay to account for mechanical valve activation delays. Precise timing ensures correct product sorting.

- **Activation Delay Active Carryway** accounts for mechanical delays from valve activation signal to carryway activation.
- **De-activation Delay Active Carryway** accounts for mechanical delays from valve deactivation signal to carryway deactivation.

NOTE: Adjust activation and deactivation delay to eliminate "belt jump." For more information, see the [ISC CAM Troubleshooting Guide](#).

6 ADJUST TRAJECTORIES AND RECIPES

DARB: OPTIMIZE DIVERT TRAJECTORIES

Adjust the **product tracking point**, **divert trigger point**, and **divert distance dwell** to optimize product trajectory for each destination. The graphic to the left of the parameters displays the **product tracking point**.



Figure 73: Destination 1 trajectory settings

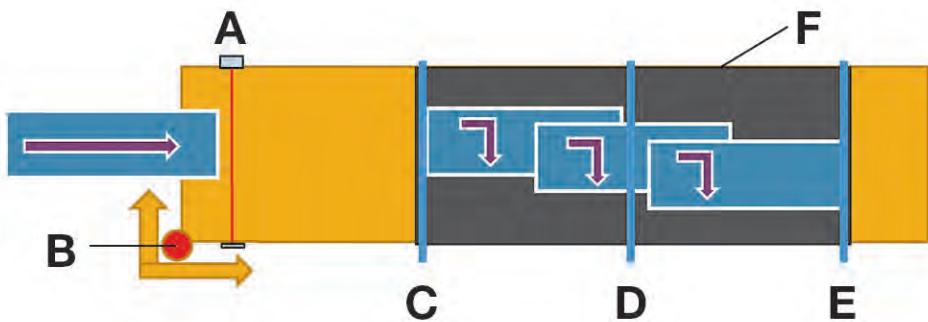
PRODUCT TRACKING POINT FOR DARB

A DARB active carryway can activate when the leading edge, center, or trailing edge of a product reaches the active carryway edge closest to the infeed.

- **Leading edge:** Activate when the leading edge of the product reaches the end of the active carryway. [Animation](#)
- **Center:** Activate when the center of the product reaches the center of the active carryway. [Animation](#)
- **Trailing edge:** Activate when the trailing edge of the product reaches the start of the active carryway. [Animation](#)



Figure 74: DARB product tracking point parameter



- | | |
|-----------------|-------------------|
| A infeed PE | D center |
| B zero position | E leading edge |
| C trailing edge | F active carryway |

Figure 75: DARB product tracking points

DIVERT TRIGGER POINT FOR DARB

Adjust the divert trigger point to shift the position on the belt where the product is diverted.

- **Negative value:** Shift the divert trigger point towards the infeed. [Animation](#)
- **Positive value:** Shift the divert trigger point towards the outfeed. [Animation](#)

6 ADJUST TRAJECTORIES AND RECIPES

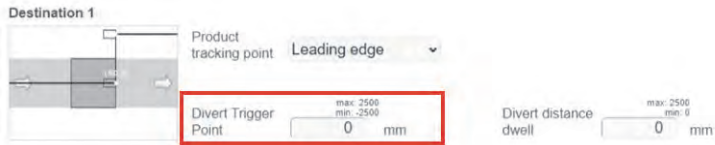
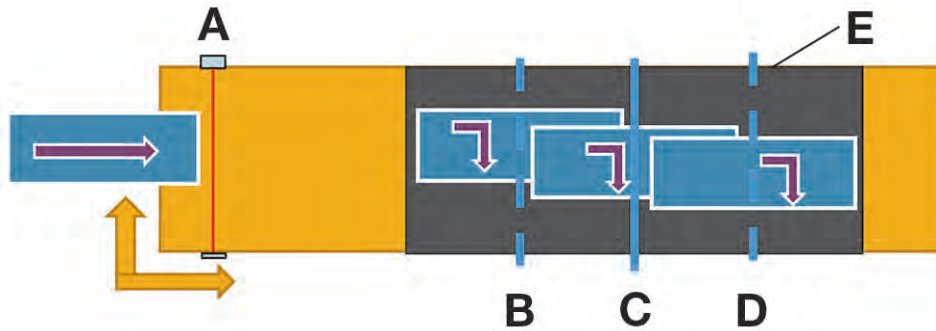


Figure 76: DARB divert trigger point parameter



- A infeed PE
- B negative divert trigger point offset
- C no divert trigger point offset
- D positive divert trigger point offset
- E active carryway

Figure 77: DARB divert trigger point

DIVERT DISTANCE DWELL FOR DARB

The **Divert distance dwell** parameter regulates the extent of sideways movement during activation.

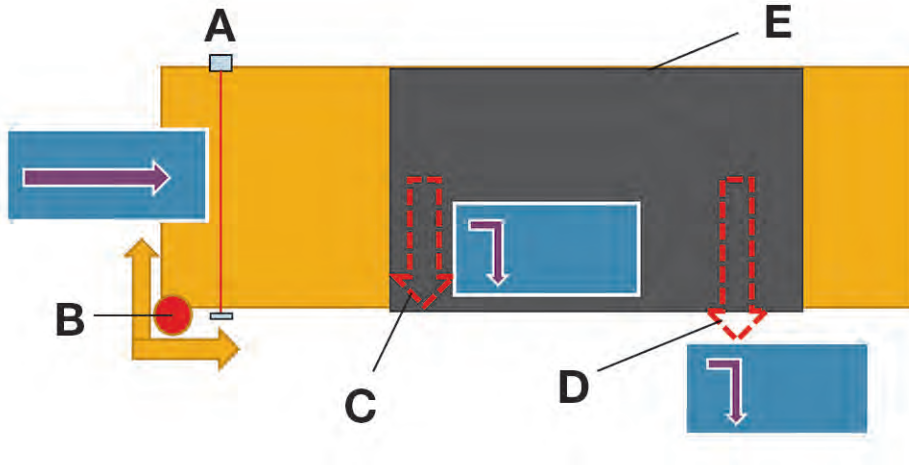


Figure 78: Destination 1 divert distance dwell

The default value for **Divert distance dwell** is 0, which applies a divert distance dwell of the width of the active carryway. Any value other than 0 sets the distance of activation.

NOTE: If the product tracking point is set to center or trailing edge, the divert distance dwell value can exceed the belt width. However, if the product tracking point is set to the leading edge option, the **Divert distance dwell** value cannot exceed the belt width. Equipment malfunctions can occur if the tracking point is set to the leading edge option and the **Divert distance dwell** value exceeds the belt width.

6 ADJUST TRAJECTORIES AND RECIPES



- A infeed PE
- B zero position
- C short divert distance dwell
- D long divert distance dwell
- E active carryway

Figure 79: DARB Divert Distance Dwell

ARB S7000/S7050: OPTIMIZE DIVERT TRAJECTORIES

This section contains details on the parameters available to optimize divert trajectories on ARB S7000/S7050 equipment. The parameters available to optimize divert trajectories vary for Sorter and Switch equipment.

All ARB S7000/S7050: **Product tracking point**

ARB S7000/S7050 Sorter: **Divert trigger point, Divert distance dwell**

ARB S7000/S7050 Switch: **Trigger point**

PRODUCT TRACKING POINT FOR ARB S7000/S7050

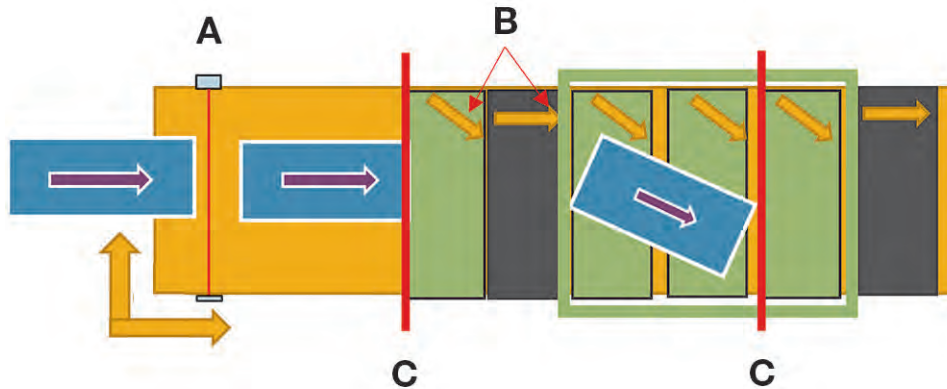


Figure 80: Product tracking point parameter

An ARB Sorter S7000/S7050 or an ARB Switch S7000/S7050 active carryway can activate when the leading edge, center, or trailing edge of a product reaches the active carryway edge closest to the infeed. When the **Product tracking point** is set to leading edge or center, products rotate as they enter the active carryway. This rotation occurs because the leading edge begins to move horizontally on the activated carryway before the trailing edge enters the active carryway.

6 ADJUST TRAJECTORIES AND RECIPES

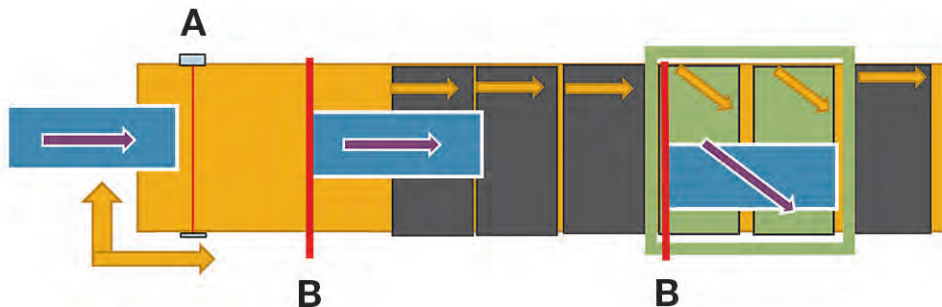
- **Leading edge:** Activate when the leading edge of the product reaches the trigger point, which rotates the product.



- A** infeed PE
- B** active carryway direction
- C** leading edge

Figure 81: Leading edge activation diagram

- **Center:** Activate when the center of the product reaches the trigger point, which can rotate the product.
- **Trailing edge:** Activate when the trailing edge of the product reaches the trigger point, which does not rotate the product.



- A** infeed PE
- B** trailing edge

Figure 82: Trailing edge activation diagram

ARB S7000/S7050 SORTER TRAJECTORY PARAMETERS

The following trajectory parameters are only available for ARB S7000/S7050 Switch equipment.

DIVERT TRIGGER POINT FOR S7000/S7050 SORTER

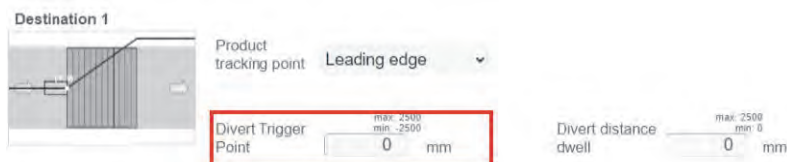


Figure 83: Divert Trigger Point

Adjust the **Divert Trigger Point** to optimize the position at which the product is diverted by applying an offset (negative or positive) to the tracking point:

- **Negative offset:** The divert point is shifted towards the infeed.
- **Positive offset:** The divert point is shifted towards the outfeed.

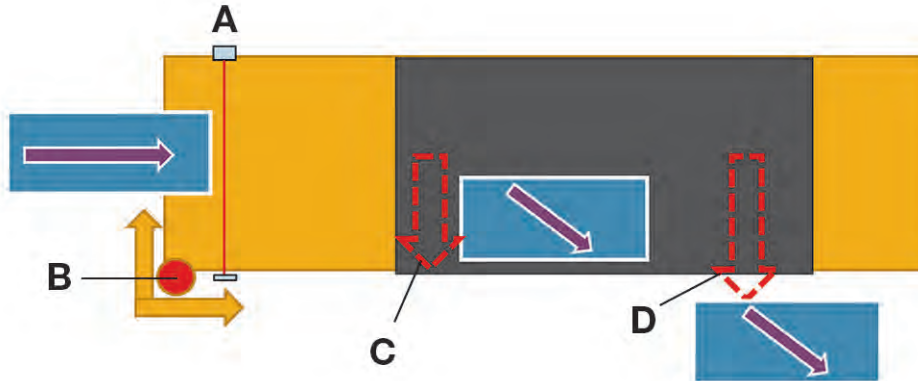
6 ADJUST TRAJECTORIES AND RECIPES

Animation

DIVERT DISTANCE DWELL FOR S7000/S7050 SORTER

Divert distance dwell regulates the extent of sideways movement during activation.

The default value for the **Divert distance dwell** field is 0, which applies a divert distance dwell value based on an internal calculation.



A infeed PE

B zero position

C short divert distance dwell

D long divert distance dwell

Figure 84: Divert distance dwell diagram

ARB S7000/S7050 SWITCH TRAJECTORIES

The following trajectory parameters are only available for ARB S7000/S7050 Switch equipment.

TRIGGER POINT FOR S7000/S7050 SWITCH

A trigger point is the point at which the product direction changes. Each trigger point is defined using the following parameters:

- Distance:** This parameter determines the distance from the start of the active carryway to the trigger point. The parameter defines where on the active carryway the product direction changes.
NOTE: The trigger point distance uses the start of the active carryway as its zero position, unlike other parameters that reference the equipment infeed as zero.
- Direction:** This parameter sets the product direction on the active carryway. The options vary depending on the type of belt:
 - For bi-directional belts, the activation direction can be set to Left, Straight, or Right.
 - For unidirectional belts, the activation direction can be set to either Left/Right or Straight.

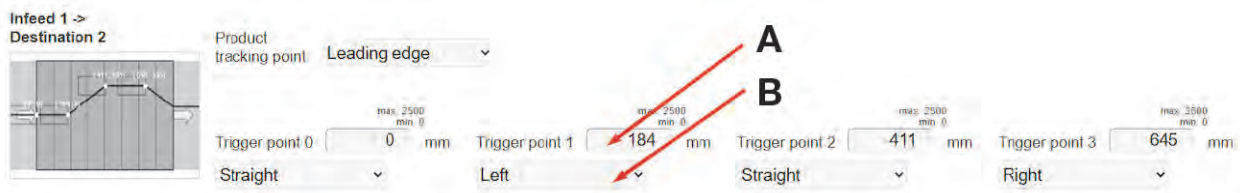
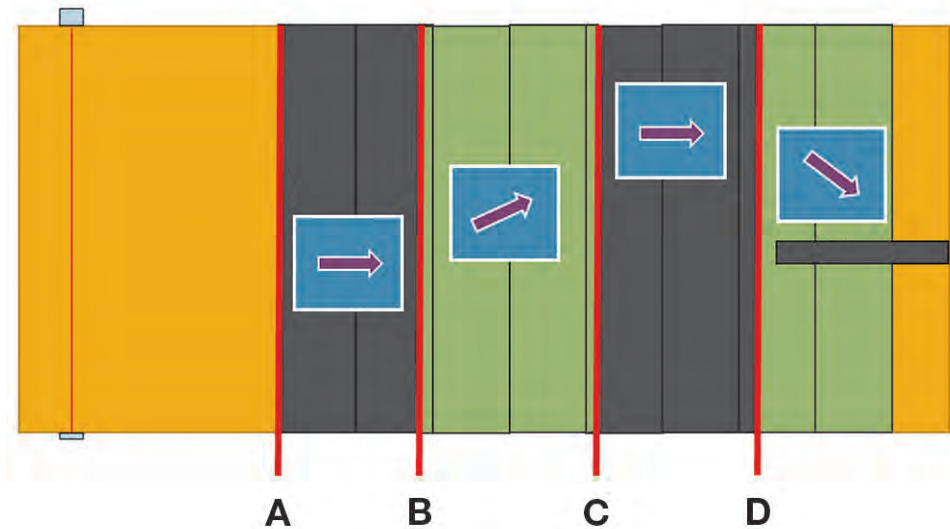


Figure 85: Switch trigger point example settings

A: trigger point distance

B: trigger point direction

6 ADJUST TRAJECTORIES AND RECIPES



A trigger point 1 (straight)

B trigger point 2 (left)

C trigger point 3 (straight)

D trigger point 4 (right)

Figure 86: Switch trigger point example diagram

NOTE: If fewer than four (4) trigger points are required, set unused trigger points to the same values as the last used point.

PRODUCT ORIENTATION

For S7000/S7050 Switch equipment, the product tracking point selection affects how products rotate on the equipment. If the "Leading edge" product tracking point is selected, the product rotates as it reaches each trigger point. For example, if the product switches to the left, the product is turned to the left. In this animation, the product tracking point is set to "Leading edge" for all three destinations.

[Animation](#)

If the "Trailing edge" product tracking point is selected, the product retains its orientation. In this animation, the product tracking point is set to "Trailing edge" for all three destinations.

[Animation](#)

COMPLEX SWITCH TRAJECTORY ANIMATIONS

Click the links to view animations of different tracking point and trajectory configurations.

- Trigger 1: Straight
- Trigger 2: Left
- Trigger 3: Straight
- Trigger 4: Right

[Animation](#)

- Trigger 1: Right
- Trigger 2: Straight
- Trigger 3: Right
- Trigger 3: Straight

[Animation](#)

TRAJECTORY RECIPES

The ISC CAM can store up to eight (8) "recipes" or trajectory setting presets. Select the active recipe on the **Settings** HMI page. Only the active recipe is editable. If you change the trajectory settings and click **Submit**, the settings are automatically saved to the active recipe. The active recipe cannot be changed while settings are being saved.

NOTE: Only change the active recipe when there are no products on the belt.

DARB TRAJECTORY RECIPE EXAMPLE

For a DARB sorter, use a recipe to set a smaller divert distance dwell for smaller products. A smaller divert distance dwell reduces the activation period and improves efficiency.



Figure 87: Recipe 0 - Larger product, longer activation



Figure 88: Recipe 1 – Smaller product, shorter activation

6 ADJUST TRAJECTORIES AND RECIPES

ARB S7000/S7050 SORTER TRAJECTORY RECIPE

For an ARB S7000/S7050 Sorter, use a recipe to set a larger **Divert Trigger Point** for smaller products. A larger **Divert Trigger Point** delays activation and improves efficiency.



Figure 89: Recipe 0 – Larger product, smaller divert trigger point



Figure 90: Recipe 1 – Smaller product, larger divert trigger point

7 OTHER HMI SETTINGS

This section includes information about other HMI parameters and functions available in the ISC CAM HMI. Most parameters are accessible on the **Settings** HMI page. Some functions are accessible on other HMI pages.

PLC commands can change any of the listed settings. See [PLC Integration](#) for more information.

MODES AND ACTIONS

The modes and actions settings apply to all products, destinations, and trajectories. Configure these settings on the **Settings** HMI page, or with PLC commands.

RETAIN ACTIVATION

When Retain Activation is set to **Yes**, the active carryway remains activated until the next product transfers onto the equipment. Retaining activation can reduce noise and support quicker resumption of operation after interruptions, but increases wear on pneumatic components.

[Animation: S7000 switch with retain activation off](#)

[Animation: S7000 switch with retain activation on](#)

For more information, see the equipment technical package or contact Intralox Customer Service.

PRODUCT TRAIN MODE

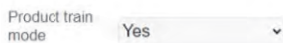


Figure 91: Product train mode on the Settings HMI page

Product train mode enables products to accumulate on the equipment, forming a "train" (also referred to as "slug") of products with small gaps between them. The train of products moves along the equipment line as a group, which supports group processing and provides multiple benefits:

- **Streamlined packing and shipping:** Products that are part of a single order can be grouped in a train.
- **Faster throughput:** Managing products as a train reduces movements, increases processing speed, and increases throughput.

When product train mode is enabled:

- Gap faults and warnings are ignored.
- The jam detection mechanism is disabled.
- The internal mode destination counter does not increment until a gap bigger than the minimum gap is detected.

[Animation](#)

If product train mode is enabled, you can use the gap warning setting to identify product trains.

- Products that are separated by only the minimum gap are treated as one (1) train.
- When the gap between two (2) products is greater than the minimum gap, the second product is considered part of a new train.

For ARB S7000/S7050 Switch equipment with more than one (1) infeed, set the product train mode to **Yes, parallel slugs** to allow product slugs on multiple infeed lanes.

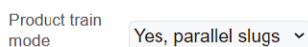


Figure 92: Parallel slugs product train mode on the Settings HMI page

Animation

MINIMUM GAP SIZE

Generic

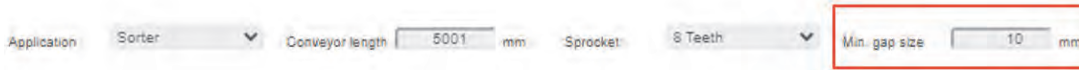


Figure 93: Minimum gap size on Equipment HMI page

An adequate gap between products is critical for effective operation. If the detected gap between products is too small, the **Gap Too Small** fault occurs. Intralox engineers define the minimum gap size during equipment design. View the **Min. gap size** value in the generic section of the **Equipment** HMI page. Set the gap warning distance above the minimum gap size to receive a warning when gaps approach the minimum size for effective operation.

GAP TOO SMALL ACTION

Application Settings



Figure 94: Gap too small action on Settings HMI page

The **Gap too small action** defines how ISC CAM acts on a product following an insufficient gap. Select the **Gap too small action** on the **Settings** HMI page. Select the action most suitable for the production line application and needs.

The **Gap too small action** is taken for the product immediately following the insufficient gap.

- **Follow previous:** When the ISC CAM detects a too-small gap between one (1) product and the next, it attempts to send the second product to the same destination as the first product. This setting is useful for identical products and non-dependent destinations.
- **Attempt to divert:** When the ISC CAM detects a too-small gap between one (1) product and the next, it attempts to send the second product to its assigned destination. Success may vary based on product size, weight, and equipment load and speed. (This option is available for sorters, but not switches.)
- **End off:** When the ISC CAM detects a too-small gap between one (1) product and the next, it attempts to send the second product to the outfeed. (This option is available for sorters, but not switches.)



- A** product assigned to destination C after small gap
 - B** gap too small action: follow previous
 - C** gap too small action: attempt to divert
 - D** gap too small action: end off
- Figure 95:** Gap too small action

GAP WARNING DISTANCE

Application Settings

Run mode: Internal

Artificial min. product length: 0 mm (max: 1000, min: 0)

Gap warning distance: 202 mm (max: 1500, min: 0)

Figure 96: Gap warning distance on the Settings HMI page

The **Gap warning distance** activates a warning when the infeed PE detects a gap between consecutive products or trains smaller than the configured value.

Set the **Gap warning distance** slightly above the **Min. gap size** value on the **Equipment** HMI page. A gap warning distance of **0** disables gap size warnings.

LENGTHS AND DISTANCES

JAM WARNING DISTANCE

Run mode: Internal | Gap too small action: End Off

Artificial min. product length: 0 mm (max: 1000, min: 0)

Debounce distance: 0 mm (max: 100, min: 0)

Gap warning distance: 202 mm (max: 1500, min: 0)

Jam warning distance: 1000 mm (max: 1500, min: 0)

Figure 97: Jam warning distance on the Settings HMI page

The **Jam warning distance** triggers a warning when the infeed PE remains blocked for the specified length as measured by encoder pulses. Set the jam warning distance slightly below the jam distance listed on the **Equipment** HMI page to receive a warning before the jam fault triggers. The jam warning cannot be disabled.

DEBOUNCE DISTANCE

Run mode: Internal | Retain activation: Yes

Product train mode: No

Artificial min. product length: 304 mm (max: 1000, min: 0)

Debounce distance: 38 mm (max: 100, min: 0)

Figure 98: Debounce distance on the Settings HMI page

The **Debounce distance** filters infeed PE signals. A product is only detected when the infeed PE is blocked longer than the specified **Debounce distance**.

Set the **Debounce distance** to eliminate false triggers from product artifacts such as open flaps and loose packing materials. Proper configuration ensures the infeed PE responds only to intended product features.

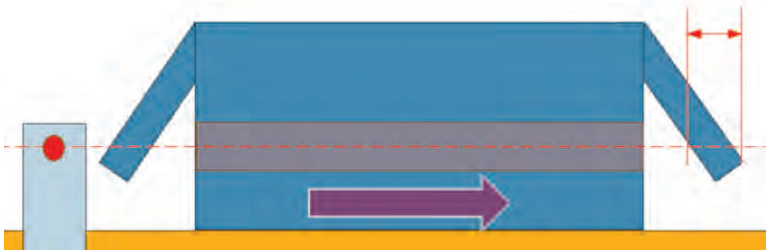


Figure 99: Debounce distance filters product flap detection

NOTE: A long debounce distance delays activation.

ARTIFICIAL MINIMUM PRODUCT LENGTH



Figure 100: Artificial minimum product length on the Settings HMI page

The artificial minimum product length compensates for partly transparent products that do not trigger consistent infeed PE readings, such as crates, shrink-wrapped soda bottles, or other products with uneven surfaces. Products must have non-transparent areas at both ends for this function to properly work.

When the infeed PE detects a product shorter than the artificial minimum product length value, the ISC CAM assigns the minimum length to that product. The system then ignores infeed PE changes until the infeed PE is blocked for a length greater than the specified artificial product length distance.

After the product moves the artificial product length:

- If the infeed PE is blocked, the ISC CAM sets the product length to the detected product length.
- If the infeed PE is not blocked, the ISC CAM keeps the artificial product length as the product length.

If the artificial minimum product length is larger than the product, the actual gap following the product must exceed the artificial minimum product length.

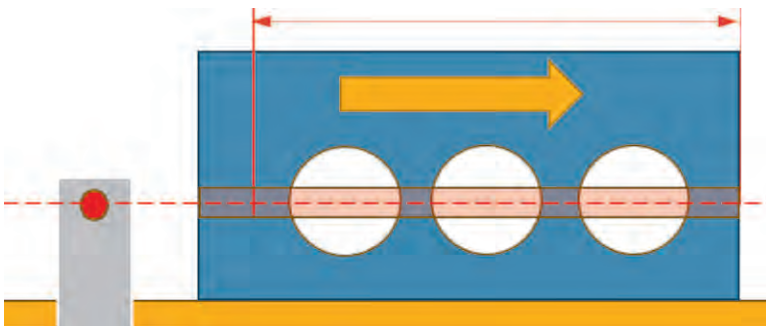


Figure 101: Crate with holes registered as one (1) product

NOTE: This setting differs from the minimum product length parameter in the previous firmware version, IDL-C-1.x.

BELT PITCH OVERRIDE

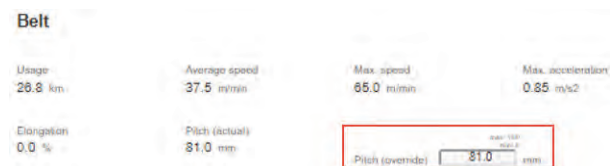
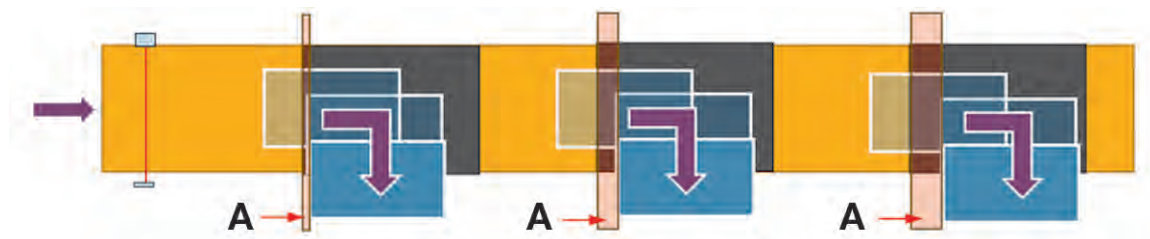


Figure 102: Belt pitch override on the Maintenance HMI page

Use the belt pitch override to compensate for belt elongation. It is normal for belts to elongate over time. A belt pitch value that does not match the actual belt pitch delays activation and leads to inaccurate product diversion. Set the belt pitch override value to the actual belt pitch to ensure proper activation. For more information about measuring and managing belt elongation, see the maintenance section of your equipment user manual and Intralox how-to videos about [Managing Belt Life](#).



A divert error

Figure 103: Incorrect belt pitch causes inaccurate product divert

DISABLE SORTER CARRYWAYS

For sorter applications, enable or disable each carryway on the **Live Info** HMI page. Disabled carryways do not divert packages.

NOTE: The valve override can activate a disabled carryway. See [Valve Override](#) for more information.

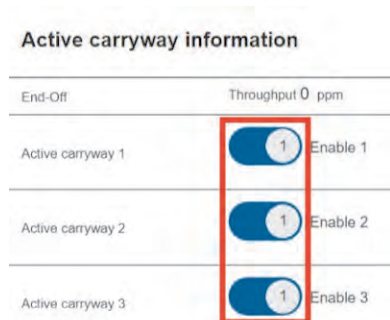


Figure 104: Enable or disable each carryway

VALVE OVERRIDE

During normal operation, the ISC CAM relies on an infeed PE signal to energize valves and activate the active carryway. In non-production scenarios, such as maintenance and troubleshooting, you can use the valve override setting to manually activate the valve without external signals. When the valve override is enabled, the valve is no longer controlled by the ISC CAM

Set the valve override on the **IO-COMM** HMI page. Use the valve override to verify the active carryway components are properly working. Advanced users can also control the override with a PLC during startup, cleaning, and other transient states of the production line. For more information, contact Intralox Customer Service.

SET THE VALVE OVERRIDE FOR DARB AND AIM TECHNOLOGY

Set the valve override for each DARB or AIM carryway.

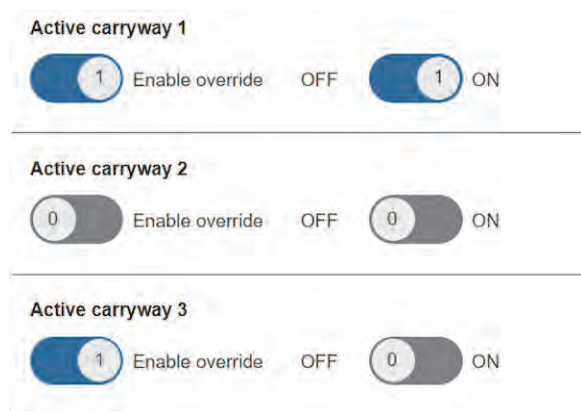


Figure 105: Valve overrides on IO-COMM HMI page

1. On the **IO-COMM** HMI page, turn on **Enable override** for the carryway.
The toggle value **1** indicates that the override is active and the valve is no longer controlled by the ISC CAM divert logic.
2. Set the valve state to **ON (1)** or **OFF (0)**.

SET THE VALVE OVERRIDE FOR ARB S7000/S7050 TECHNOLOGY

Set the valve override for a single valve in a carryway.

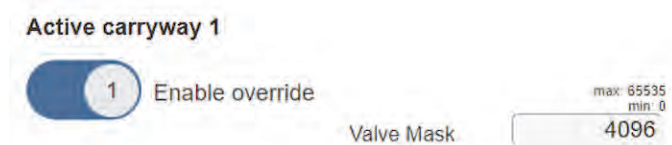


Figure 106: Valve override on IO COMM page

1. Click the **Enable override** toggle to enable or disable the override.
The toggle value **1** indicates the override is active and the valve is no longer controlled by the ISC CAM divert logic.
2. Set the binary integer that represents the intended valve based on the table of valve mask numbers.

Valve Bank LED	Web-based HMI	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

7 OTHER HMI SETTINGS

Valve Bank LED	Web-based HMI	Valve Mask Number
8	8	256
9	9	512
10	A	1024
11	B	2048
12	C	4096
13	D	8192
14	E	16384
15	F	32768

Valve overrides

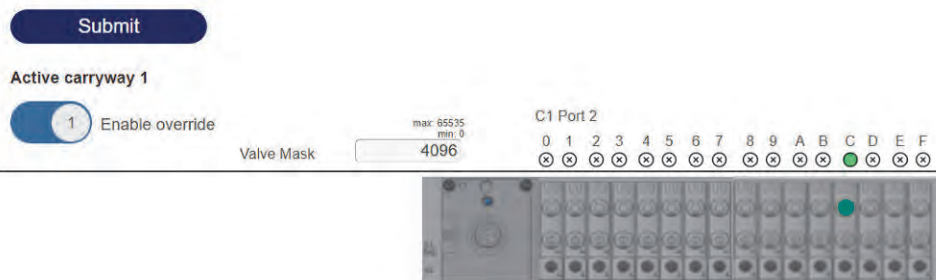


Figure 107: Enter the valve mask number

8 EXPORT SETTINGS

After commissioning is complete and the ISC CAM is properly functioning, export the settings from the **Settings** HMI page and save the configuration in a safe location as a backup. If desired, send the file to Intralox Customer Service to store alongside the Technical File.

1. On the **Settings** HMI page, scroll down to **Application Data** and click **Export settings** to export all Application Settings.

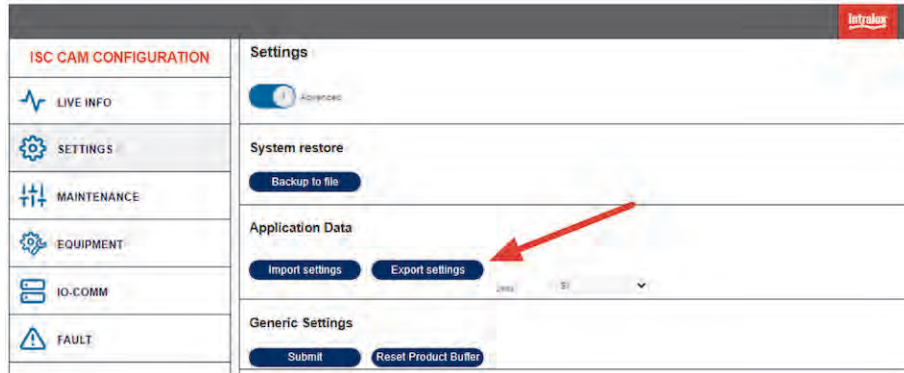


Figure 108: Export settings on Settings HMI page

The parameters of your application are exported as an application (.apl) file.

2. Save the .apl file to a secure location for future reference.
3. For all (6) six pages of the HMI, take screenshots (in Microsoft Windows, press Windows Key + Shift + S) of all values and parameters on the page.

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