



COMMISSIONING GUIDELINE

ISC CAM

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INTRODUCTION

INTENT OF THE ISC CAM COMMISSIONING GUIDE

The purpose of this document is to support equipment integrators when commissioning the Intralox® Smart Carryway (ISC) Carryway Automation Module (CAM) during on-site installation and integration. This guide assumes the user is familiar with Activated Roller Belt™ (ARB™) equipment and / or Active Integrated Motion™ (AIM™) equipment, Program Logic Controls (PLC), and Input/Output (I/O) devices.

SUPPORT DOCUMENTS

Before beginning the ISC CAM integration, gather the following support documents within the ISC CAM User Manual.

Application Functional Layout: The layout provides application information like product trajectories, belt speeds, and minimum product gaps.

Mechanical Drawing: The drawings provide the dimensions of the Intralox equipment and identify component positions.

Additional support documents are also required. See our [ISC Setup](#) page on the Intralox website for the following support documents:

- ISC CAM Connection diagram
- ISC CAM Communication Interlocks
- ISC CAM HMI Instructions

RESOURCES

ISC CAM web page: [ISC Setup](#)

Intralox equipment technical documentation

BASIC SETUP

Before powering on the ISC CAM, the required interfaces must be set up. How these interfaces appear depends largely on the intended ISC CAM operational mode.

Refer to the webpage [ISC Setup](#) and documents and the documents below:

- vHMI documentation on how to connect to the vHMI to configure the ISC CAM.
- Connection diagram for connection details.
Interlock file for communication, signal exchange, and timing details. Operational Modes

The ISC CAM has two operational modes:

1. External mode: ISC CAM receives operational commands from a parent device.
2. Internal mode: ISC CAM performs all actions independently.

The mode of operation is determined by changing the Run Mode configuration on the EQUIPMENT page of the Virtual HMI (vHMI). Depending on the required operation mode, the steps may differ slightly. Configuration changes may be made through the vHMI or the parent device connection.

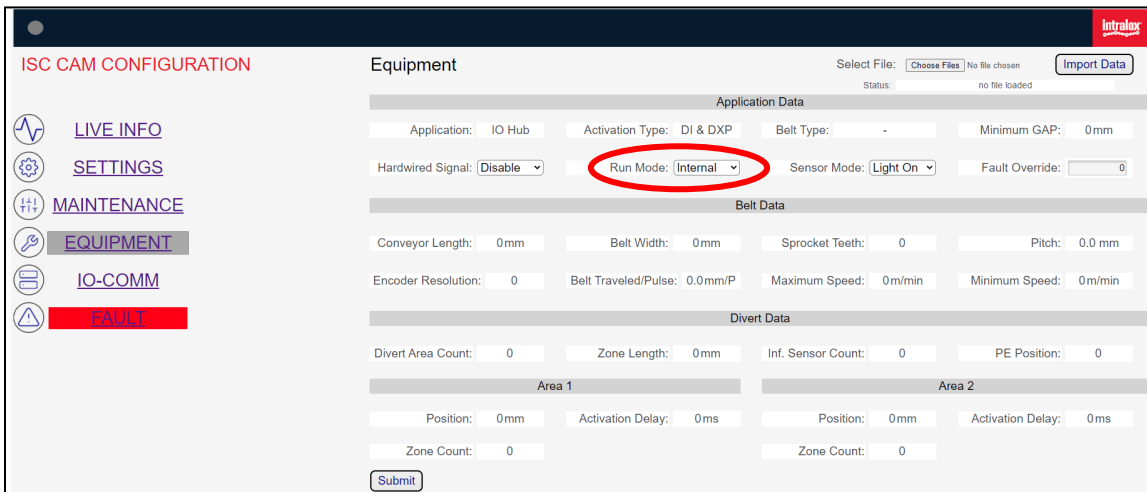


Figure 1: Run mode selection in vHMI

ISC CAM IN EXTERNAL MODE

In this mode, the ISC CAM receives all divert commands from a parent device, typically a line PLC, or an inspector. In this mode, the ISC CAM must be connected to the parent device, either by an ethernet connection, and/or via a 24V discrete I/O.

To be able to act upon the instructions of the parent device, the ISC CAM is equipped with two options for receiving commands and providing status updates:

1. Ethernet, allows for sending and receiving complex instructions. Ethernet is usually the preferred option. This mode allows the parent device to update the settings of the ISC CAM and to receive detailed status and error information.

2. 24 V discrete I/O, the hardwire signal connection, allows for sending and receiving messages at high speed. This option is aimed at situations where communication via ethernet is not fast enough, as is typically seen with inspectors. This option is also aimed at situations where no ethernet is available. For this mode, two I/Os by the C3 are dedicated: an input to receive divert commands, and an output providing a run/error signal. This option is only applicable for the first destination/reject. See section of hardwire signal connection (C3).

Enable the “hardwire signal” on vHMI, EQUIPMENT page, “Hardwired Signal”, select “enable” in the drop-down menu. See section “HARDWIRE CONNECTION SIGNAL (C3)” for details of LED indications lights on ISC CAM.

The screenshot shows the 'Equipment' configuration page. At the top, there are file selection buttons: 'Select File: Choose Files No file chosen Import Data' and a status indicator 'Status: machine constants file loaded'. Below this are two 'Application Data' sections. The first section has the following settings: Application: Switch, Activation Type: R&R 1-3, Belt Type: S7050 ARB, Minimum GAP: 65 mm, Hardwired Signal: Disable (dropdown), Run Mode: Internal (dropdown), Sensor Mode: Light On (dropdown), and Fault Override: 0. The second section has: Application: Switch, Activation Type: Popup, Belt Type: S4500 DARB, Minimum GAP: 0 mm, Hardwired Signal: Enable (dropdown), Run Mode: Internal (dropdown), Sensor Mode: Light On (dropdown), and Fault Override: 0. A red arrow points to the 'Enable' dropdown in the second section.

Figure 1: Enable Hardwired Signal in vHMI

NOTE: Once communication between the ISC CAM and the parent device is set up, some fields of the vHMI may not be available for adjustments. See section “COMMAND PRIORITIZATION”.

ISC CAM IN INTERNAL MODE

In internal mode, the ISC CAM performs all actions independently, without the need of interaction with a parent device. But, to make it possible for the parent device to receive updates, or for it to be updated remotely, we recommend maintaining an ethernet connection to the parent device.

Once the ISC CAM is configured to function in internal mode, the ISC CAM will full autonomously decide how to divert each product based on preset parameters. This mode can be used to either make the Intralox equipment fully independent, or to offload work from a parent device.

NOTE: In the absence of external commands, the ISC CAM will perform in internal mode. This is a pre-defined divert action to each infeeded product. The Run Mode settings can be switched from internal to external and vice-versa by an external command from the parent device of the ISC.

If no parent device is connected, the ISC CAM configuration must be done using the vHMI. If a parent device is connected via ethernet, the configuration can be done either using the vHMI or via the parent device via the ethernet. See section “COMMAND PRIORITIZATION”.

COMMAD PRIORITIZATION

The ISC CAM prioritizes inputs in the following order:

1. Hardwire signal
2. Parent device
3. vHMI

When connecting a parent device to the ISC CAM, the parent device settings take priority over the vHMI settings even if the parent settings have no parameters specified. Therefore, make sure the connected parent device has the required set of parameters. Otherwise, the ISC CAM will not function, regardless of whether the vHMI is in **Internal** mode or **External** mode.

In the situation where both the ethernet and 24 V discrete I/O are used simultaneously, the 24 V discrete I/O takes priority over the ethernet instructions, using the following logic:

Ethernet	24 V discrete I/O	Product divert destination
Destination 0	LOW (0 V)	Destination 0 (end off)
Destination 0	HIGH (24 V)	Destination 1
Destination 1	LOW (0 V)	Destination 1
Destination 1	HIGH (24 V)	Destination 1
Destination 2/3/4/5/6*	LOW (0 V)	Destination 2/3/4/5/6*
Destination 2/3/4/5/6*	HIGH (24 V)	Destination 1

* Depending on the equipment configuration

POWER ON

Refer to the Connection diagram for connection details.

Refer to the guidelines for troubleshooting the ISC CAM for the details.

Once the desired operational mode has been decided and the required electrical connections have been made (see previous section), the ISC CAM can be powered on.



Figure 1: Verify power status

A BUS, ERR, and PWR LED indicators

B ETH1 and ETH2 indicators

The boot process takes about 20 seconds to complete. During this time, the various LEDs on the ISC CAM may flash and change color a few times. This is normal behavior.

When the boot process is complete, the PWR and ERR LED should be lit green. The BUS LED should flash three (3) times.

When the ISC CAM is connected to the ethernet, the ETH1 and or ETH2 LED should flash green (100-Mbit connection) or yellow (10-Mbit connection).

Depending on the equipment configuration, other LEDs may also be lit/blink green.

If any of the following LED conditions is present, an error must be resolved. Refer to the guideline for Troubleshooting the ISC CAM.

LED Conditions
PWR LED is lit red
PWR LED is off
BUS LED is lit red (not flashing)
BUS LED slow flashing red or green (1 Hz)
ERR LED is lit red
Port LED 0, 2, 4 or 6 is red or red flashing
Port LED 1, 3, 5 or 7 is red

NETWORK SETUP

NOTE: This step is only required if the ISC CAM is connected to a parent device using ethernet.

NOTE: Before continuing, make sure the ISC CAM is correctly, electrically configured and powered as described in the previous section.

The ISC CAM operates as an integrated device when configured to **External** mode. The ISC CAM receives external device communication from the parent device or from another external device on the factory network. In the absence of external commands, the ISC CAM performs an autonomous mode action.

See the ISC CAM Connection diagram for ethernet connection points (**P1**, **P2**) and the ISC CAM Communication Interlocks file for data exchange and timing diagram.

Verify ISC CAM ethernet communication per the status LED indicators. The ETH1 and/or ETH2 LEDs should flash green or yellow during active data exchange.

Intralox standard PLC block / address mapping is available on the Intralox ISC webpage, for easier integration of the ISC CAM into the network.



Figure 1: Network connections

A Ethernet: ETH1 and ETH2 LED indicators

To allow ethernet communication with the parent device, the IP address and / or Profinet name of the ISC CAM must be properly set. This process can be done when downloading the configuration from the parent device. Depending on the capabilities of the parent device, it may also be possible to configure these settings using the configuration software of the parent device. Please refer to the manufacturer documentation on how to use this function.

Or with the Intralox ISC Service tool, which is available for download from the Intralox ISC webpage.

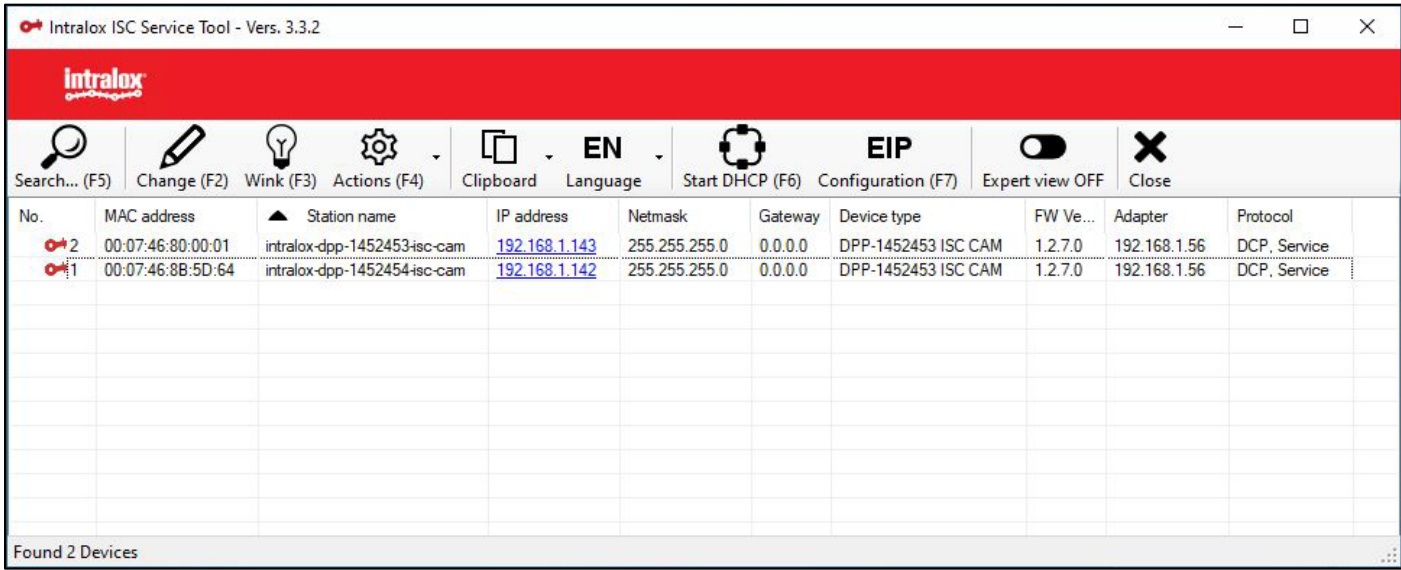


Figure 2: Intralox ISC service tool

Connect a laptop with the Intralox ISC Service tool installed to the same ethernet network as the ISC CAM. In the Intralox ISC Service tool, use the Search function to find the ISC CAM on the network. In the list of found devices, highlight the ISC CAM that requires configuration. If multiple devices are found on the network, and you are unsure the correct ISC CAM is highlighted, use the wink function to activate a bright white strobe light on the ISC CAM. This action makes it easy to validate the correct selection. Once the correct ISC CAM is selected in the Intralox ISC Service tool, press Change. Doing this opens a dialog box allowing you to set both the IP address and the Profinet name.

NOTE: After the IP address of the ISC CAM is changed, reboot or power cycle of ISC CAM. The ISC CAM may not function as intended if not rebooted.

HARDWIRE SIGNAL CONNECTION (C3)

The ISC CAM can receive divert commands from a parent device via a 24V discrete I/O to divert products to 1 destination only. Connect the parent device to C3.



Figure 1: Hardwire signal connections

A C3 is available for hardwire signals.

Pin position	Function	Description	LED Condition
Pin 1	24VDC Power out (optional)		Not applicable
Pin 2	OUTPUT to PLC	Low (0V): equipment not running OR fault detected	LED 7 is off
		High(24V): equipment running, AND no faults detected	LED 7 is green
Pin 3	Ground		Not applicable
Pin 4	INPUT from PLC	Low (0V): Product will not be diverted to destination 1	LED 6 is off
		High (24V): Product will divert to destination 1.	LED 6 is green
C3 Interface: M12 female A-Coded, 18...30 DVC, 7mA per input, 0.5A per output, <u>unfused</u> .			

To divert the product to destination 1, the hardwire signal must be high to the ISC CAM before the product crosses the infeed photo eye's beam. (More detail please see "interlock file – Timing diagram - Hardwired signal" on the webpage [ISC Setup](#) .)

CONNECT TO VIRTUAL HMI

Refer to the Connection diagram for connection details.

Refer to the ISC CAM Quick Startup Guide, on the ISC CAM web page: [ISC Setup](#) for vHMI connection details.

NOTE: Before continuing, make sure the ISC CAM is correctly electrically connected, powered on, and booted successfully, electrically configured and powered as described in the previous sections. Establish your connection to the vHMI. Connect the ISC CAM to the computer (using either the ETH1 or ETH2 port).

NOTE: If the ISC CAM is connected to a parent device via ethernet, make sure the ISC CAM network setup is complete before continuing.

Validate that the ISC CAM configuration file is loaded, as shown in the example, on the vHMI. Validation is done by comparing the serial number documented on the bottom-right corner of the vHMI screen to the serial number on the ISC CAM identification plate.

NOTE: If the ISC CAM configuration file is not loaded, contact Intralox Customer Service before proceeding.

The screenshot shows the 'ISC CAM CONFIGURATION' vHMI interface. The 'EQUIPMENT' tab is selected. The interface is divided into several sections:

- Application Data:** Application: Sorter, Activation Type: Popup, Belt Type: S4500 DARB, Minimum GAP: 260 mm, Hardwired Signal: Disable, Run Mode: Internal, Sensor Mode: Light On, Fault Override: 0.
- Belt Data:** Conveyor Length: 1150 mm, Belt Width: 406 mm, Sprocket Teeth: 10, Pitch: 50.8 mm, Encoder Resolution: 64, Belt Traveled/Pulse: 0.0 mm/P, Maximum Speed: 75 m/min, Minimum Speed: 0 m/min.
- Divert Data:** Divert Area Count: 1, Zone Length: 508 mm, Inf. Sensor Count: 1, PE Position: 181.
- Area 1:** Position: 338 mm, Activation Delay: 100 ms, Zone Count: 1.
- Area 2:** Position: 0 mm, Activation Delay: 100 ms, Zone Count: 1.

At the bottom right, the S/N field is highlighted with a red arrow and contains the value NL2022-000011. The status bar at the bottom shows: © Intralox 2021, IP Address: 0.0.0.0, MAC Address: 00:00:00:00:00:00, SW Version: V1.1, DPE Model: S4500 DARB, S/N: NL2022-000011.

Figure 2: Verify configuration file is loaded

Connect a computer to the same ethernet network as the ISC CAM. Make sure the network configuration of the computer matches the network configuration of the ISC CAM. If the network configurations do not match, they will not communicate. If necessary, consult your system administrator on how to configure your computer network.

To adjust the computer IP address (as required), access ethernet properties through the control panel and select the "internet protocol v4" configuration. When opening the properties, configure the IP address and subnet mask, as shown in the Figure. After entering the values, click OK to confirm.

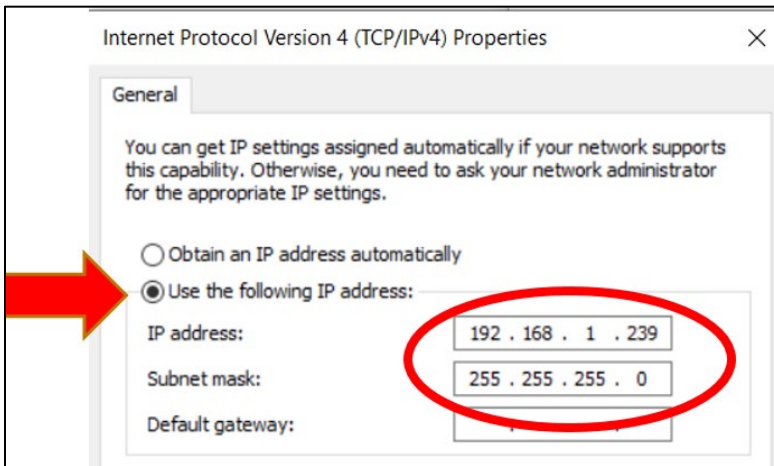


Figure 3: IP address and subnet mask

After your computer IP configuration is completed, open an internet browser. In the address bar of the browser, type the ISC CAM IP address (either 192.168.1.254 or the IP address set in the previous section) and press ENTER to open the vHMI (Refer to this video on ISC CAM web page [ISC Setup: Video – How to connect to the ISC CAM virtual HMI.](#)) Another way to open the vHMI is by double-clicking the ISC CAM IP address in the main screen of the Intralox ISC Service tool.

VERIFY AND OPTIMIZE

Confirm the vHMI is connected per the previous section.

VERIFY

ISC CAM CONFIGURATION

A serial number match was verified in the previous section.

PARENT DEVICE COMMUNICATION

Refer to the interlock file on the ISC web page [ISC Setup](#) for communication, signal exchange, and timing details.

If ethernet communication is used to communicate with a parent device, use the IO-COMM page to ensure the communication exchange between the ISC CAM and the parent device is correct. The data words on both the ISC CAM and the parent device must match.

TEST RUN

Run the ISC CAM without products and verify that all the information, on the LIVE INFO page and the IO-COMM page, are correct.

On the LIVE INFO page, make sure all relevant diverts are enabled. If connected to a parent device, the parent device must do this. If not connected to a parent device, the diverts can be disabled/enabled using the vHMI ON/OFF button.

If the ISC CAM operational mode is INTERNAL, use SETTINGS page to set the proper divert count to each divert. If the ISC CAM operational mode is set EXTERNAL, use the parent device to set a product destination.

Run the ISC CAM with products to validate that the equipment performs the functions required. Refer to the Application Functional Layout.

Test results may indicate the need for optimization. Alternatively, test results may require troubleshooting under the following conditions:

Product trajectory issues

Counter deficiencies as viewed on the vHMI (LIVE INFO and MAINTENANCE pages)

ISC CAM generates faults as viewed on the vHMI (FAULT page)

Reference the ISC CAM Troubleshooting document as needed.

OPTIMIZE

Once proper functionality of the Intralox equipment has been established, the ISC CAM can be optimized for the desired application.

Perform application optimization using the parent device or using the vHMI. Optimization can improve how the ISC CAM handles various conditions, for example,

Product slugs or trains

Divert positions in Dual-Stacked Angled Roller™ Belt (DARB™) sorting

Peg engagement and product orientation for AIM

See our [ISC Setup](#) page on the Intralox website for optimization instructions.

BACKUP

Intralox recommends backing up the settings. After the commissioning is completed, create a backup of the application settings.

Create a backup file using the Save Settings button on the SETTINGS page of the vHMI. Add the backup file to the technical documentation package of the Intralox equipment.

The screenshot shows the 'Settings' page of the vHMI. At the top right, there are two buttons: 'Import Data' and 'Save Settings'. The 'Save Settings' button is highlighted with a red rectangular box and labeled with the letter 'A'. Below the buttons is a section titled 'General Settings'. It contains four input fields: 'PE Position Offset' (0 mm), 'Default Destination' (0), 'Min Product Size' (0 mm), and 'Retain Divert' (OFF). Below this are two sections, 'Area 1' and 'Area 2', each with two input fields: 'Divert Offset' (0 mm) and 'Activation Delay Override' (0 ms). A 'Submit' button is located at the bottom left of the settings area.

Figure 1: Backup application settings

A Save Settings button

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