



COMMISSIONING INSTRUCTION

ISC CAM

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INTRODUCTION

INTENT OF THE ISC CAM COMMISSIONING INSTRUCTION

The purpose of this document is to support equipment integrators when commissioning the Intralox® Smart Carryway (ISC) Carryway Automation Module (CAM) running firmware **Intralox Divert Logic -CAM v2.x** 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, PLC, and Input/Output (I/O) devices.

Use this document only of ISC CAM IDL-C v2.x. ISC CAM running IDL-C v1.x requires another set of documentation, see directions for identification on the [ISC Webpage](#).

RESOURCES

- Intralox Equipment Technical documentation,
- ISC CAM web page: [ISC Webpage](#)
- Intralox Customer Service

SUPPORT DOCUMENTS

Before beginning the ISC CAM integration, gather the following support documents from the Intralox equipment technical documentation

- 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.

ISC CAM User Documentation available on [ISC Webpage](#)

- ISC CAM Quick Start Guide
- ISC CAM Connection Diagrams
- ISC CAM Network Integration Instruction
- ISC CAM vHMI Instruction
- (Equipment) Auxiliary Sensors

POWER ON

- Refer to the ISC CAM Connection Diagram for connection details.
- Refer to the ISC CAM Troubleshooting Guideline for the details on the LED.

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.



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 LED is red, refer to the guideline for ISC CAM Troubleshooting Guideline for details of the LED Displays ([ISC Webpage](#)).

CONNECT TO THE VIRTUAL HMI

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

Verify that the ISC CAM configuration file is loaded. Verification is done by comparing the serial number documented on the bottom-left corner of the vHMI screen to the serial number on the Intralox equipment identification plate.

NOTE: If the ISC CAM configuration file is not loaded or not matching the serial number of the equipment, contact Intralox Customer Service before proceeding.

The screenshot displays the ISC CAM vHMI interface. On the left is a navigation menu with options: ISC CAM CONFIGURATION, LIVE INFO, SETTINGS, MAINTENANCE, EQUIPMENT, IO-COMM, and FAULT. The main area is titled 'Live Info' and contains 'System Information' and 'Active carryway information'. The 'System Information' section shows status indicators for System OK, Belt Stopped, Gap OK, and Infeed PE Blocked, along with various performance metrics. The 'Active carryway information' section shows details for 'way 1', including a status indicator and throughput. At the bottom, system details are listed, with the serial number 'S/N 212-0000000683' circled in red and labeled 'Serial Number'.

System Information	
System OK	Belt Stopped
Gap OK	Infeed PE Blocked
Up time: 0:01:33:48	Belt acceleration: 0.00 m/s ²
Run time: 0:00:00:00	Belt speed: 0.0 m/min
Stand-by time: 1:17:58:19	Belt usage: 0.0 km
Gap at infeed: 0 mm	Destination last product: 0
Product length: 0 mm	Throughput: 0 ppm
Minimum gap at infeed: 0 mm	Products on belt: 0
Products buffer slots free: 32	

Active carryway information	
End-Off	Throughput 0 ppm
way 1	Enable 1 Throughput 0 ppm

System Details	
IDL V2_0233	Run Mode Internal
S4500 DARB Sorter	PLC Disconnected
S/N 212-0000000683	IP Address: 192.168.1.145
	MAC Address: 00:07:46:A2:04:B7

Verify configuration file is loaded and matching serial number

BASIC SETUP

OPERATIONAL MODES

The ISC CAM has two operational modes:

1. PLC / 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 SETTING page of the Virtual HMI (vHMI).

The screenshot displays the 'Settings' page of the ISC CAM configuration interface. On the left is a navigation menu with options: LIVE INFO, SETTINGS (highlighted), MAINTENANCE, EQUIPMENT, IO-COMM, and FAULT. The main content area is titled 'Settings' and contains 'Generic Settings' with 'Submit' and 'Reset Product Buffer' buttons, and 'Application Settings'. In the 'Application Settings' section, the 'Run mode' dropdown menu is open, showing 'Internal' and 'PLC / External' options. The 'PLC / External' option is circled in red. Other settings include 'Retain activation' (No), 'Gap too small action' (Follow previous pro...), 'Product train mode' (No), 'Artificial min. product length' (0 mm), 'Debounce distance' (0 mm), 'Gap warning distance' (0 mm), 'Jam warning distance' (0 mm), 'Default destination' (1), and 'Reject destination' (2).

3. Run mode selection in vHMI

ISC CAM IN PLC / 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 the 24V discrete I/O option.

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 hardwired 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. See section of hardwired signal connection (C3).

There may be scenarios where utilizing both command exchange mechanisms are necessary to guarantee the best performance of the Intralox Equipment.

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: The Run Mode settings can be switched from “Internal” to “PLC/External” and vice-versa by an external command from the parent device or using the vHMI. If the Run Mode is set to “PLC/External” but there is no connected PLC (parent device), then the ISC CAM will default to destination 0. If Run Mode is blank (no selection), ISC CAM will operate in “Internal” mode.

See section “COMMAND PRIORITIZATION” paragraph and ISC CAM Network Integration Instruction on [ISC Webpage](#).

REJECT SIGNAL CONNECTION (C3)

NOTE: This step is only required if the ISC CAM is connected to a parent device with a discrete 24VDC hardwired connection.

For the connector configuration, please refer ISC CAM Connection diagram on the [ISC Webpage](#).

Port C3 can be used for communicating commands to divert products with a hardwired 24VDC discrete signal to the reject destination only. The hardwired reject signal must be high to the ISC CAM when the product crosses the infeed photo eye's beam. More detail please see document ISC CAM Network Integration Instruction on the [ISC Webpage](#).



C3 Port for Hardwired signal connections

Pin position	Function	Description	LED Condition
Pin 1	24VDC Power out (optional)	24VDC power for (optional) relays	Not applicable
Pin 2	Run / Fault OUTPUT from ISC to PLC	Low (0V): equipment is not running OR fault(s) are detected	LED 7 is off
		High(24V): equipment is running, AND no faults are detected	LED 7 is green
Pin 3	Ground		Not applicable
Pin 4	Reject INPUT from PLC to ISC	Low (0V): Product will not be diverted to reject destination	LED 6 is off
		High (24V): Product will divert to reject destination	LED 6 is green

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

Configuration hardwired connector

Refer to ISC Hardwire Connection diagram available on the ISC Webpage for different connections on the side of the parent device.

The destination commanded by the “reject signal” must be specified in the vHMI, as shown in the image below, or by the parent device through the ethernet.

The screenshot shows the 'ISC CAM CONFIGURATION' vHMI interface. On the left is a navigation menu with options: LIVE INFO, SETTINGS (selected), MAINTENANCE, EQUIPMENT, IO-COMM, and FAULT. The main area is titled 'Settings' and contains 'Generic Settings' with 'Submit' and 'Reset Product Buffer' buttons. Below is the 'Application Settings' section with various parameters: Run mode (Internal/PLC / External), Retain activation (No), Gap too small action (Follow previous proc), Product train mode (No), Artificial min. product length (0 mm), Debounce distance (0 mm), Gap warning distance (0 mm), Jam warning distance (0 mm), and Default destination (1). The 'Reject destination' dropdown menu is highlighted with a red circle and set to '2'.

4. SETTING - Reject Destination, example “2”

COMMAND PRIORITIZATION

The ISC CAM prioritizes inputs in the following order:

1. Reject signal
2. Parent device (PLC)
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 may not function as intended, regardless of whether the vHMI is in **Internal** mode or **External** mode.

The screenshot shows the 'IO-COMM' status page. On the left, there are three menu items: 'EQUIPMENT' (gear icon), 'IO-COMM' (two horizontal bars icon), and 'FAULT' (warning triangle icon). The main content area is titled 'Valves IO-Link' and includes a 'C1 Port 2' status bar with 16 indicators (0-9, A-F). Below this is the 'RAW IO' section with 8 IO indicators (IO 0 to IO 7). The 'PLC communication' section shows 'Life bit' as 0 and 'Destination update Pre PE' as 811 ms, with 'Destination update Post PE' as 0 ms. It contains two tables: 'Communication from ISC CAM to PLC' and 'Communication from PLC to ISC CAM'. The 'Advanced settings' section has a toggle switch for 'Advanced' which is currently off. At the bottom, a status bar shows 'IDL V2_0245', 'S7000-ARB Switch', 'C/N switch: F000', 'Run Mode: Undefined', 'PLC Connected' (with a green checkmark), 'IP Address: 192.168.1.192', and 'MAC Address: 00:07:46:63:F8:9A'. A large red arrow points to the 'PLC Connected' status.

IO COMM - PLC communication status “PLC Connected”

The screenshot shows the 'IO-COMM' status page. On the left, there are three menu items: 'IO-COMM' (two horizontal bars icon), 'FAULT' (warning triangle icon), and 'EQUIPMENT' (gear icon). The main content area is titled 'Valves IO-Link' and includes a 'C1 Port 2' status bar with 16 indicators (0-9, A-F). Below this is the 'RAW IO' section with 8 IO indicators (IO 0 to IO 7). The 'Advanced settings' section has a toggle switch for 'Advanced' which is currently off. At the bottom, a status bar shows 'IDL V2_0233', 'S7000 ARB Switch', 'S/N S70X0 SW example', 'Run Mode: Internal', 'PLC Disconnected' (with a red X), 'IP Address: 192.168.1.145', and 'MAC Address: 00:07:46:A2:04:B7'. A large red arrow points to the 'PLC Disconnected' status.

IO COMM - PLC communication status “PLC disconnected”

NETWORK SETUP AND PLC COMMUNICATION

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.

See the ISC CAM Connection diagram for ethernet connection points (**P1**, **P2**).

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.



Network connections

A Ethernet: ETH1 and ETH2 LED indicators

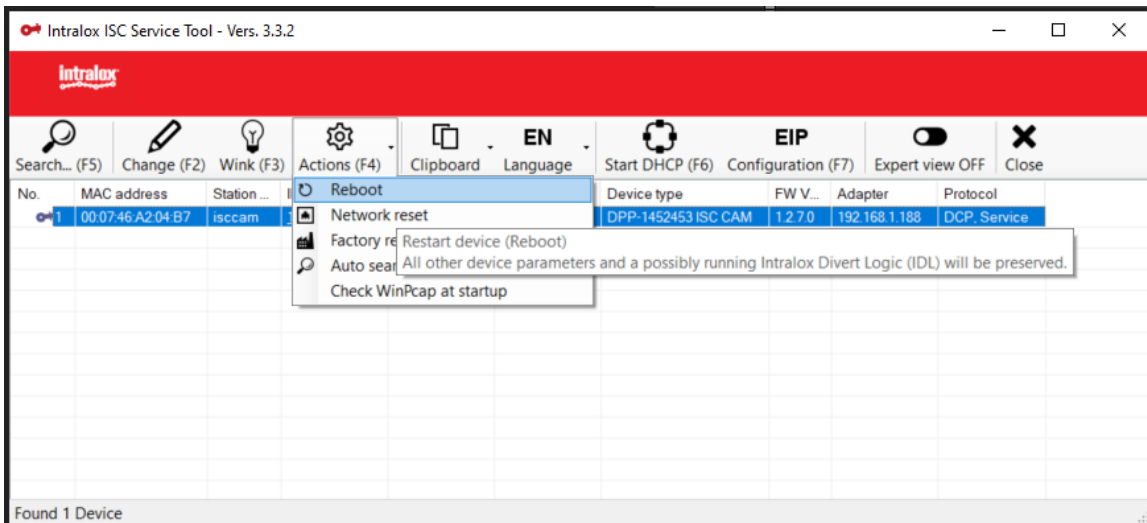
To allow ethernet communication with the parent device, the IP address and / or Profinet name of the ISC CAM must be properly set. This process can be done with parent device depending on its capabilities. Please refer to the manufacturer documentation on how to use this function. Or with the Intralox ISC Service tool, which is available for download from the Intralox [ISC webpage](#).

No.	MAC address	Station name	IP address	Netmask	Gateway	Device type	FW Ve...	Adapter	Protocol
2	00:07:46:80:00:01	intralox-dpp-1452453-isc-cam	192.168.1.143	255.255.255.0	0.0.0.0	DPP-1452453 ISC CAM	1.2.7.0	192.168.1.56	DCP, Service
1	00:07:46:8B:5D:64	intralox-dpp-1452454-isc-cam	192.168.1.142	255.255.255.0	0.0.0.0	DPP-1452453 ISC CAM	1.2.7.0	192.168.1.56	DCP, Service

Found 2 Devices

Intralox ISC service tool

NOTE: After the IP address of the ISC CAM is changed, reboot the ISC CAM with the ISC Service Tool (see image below) or power cycle the ISC CAM. The ISC CAM may not function as intended if not rebooted.



ISC CAM Reboot with ISC Service Tool

Refer to the ISC CAM Network Integration Instruction to set-up the communication between the ISC CAM and the PLC (Parent Device).

VERIFY AND OPTIMIZE

VERIFY

ISC CAM CONFIGURATION

A serial number match was verified in the previous section.

PARENT DEVICE COMMUNICATION

See [ISC Webpage](#) the following documents,

- ISC CAM Network Integration Instruction
- ISC CAM vHMI Instruction
- (Equipment) Auxiliary Sensors

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. The ISC - PLC communication is only visible if a PLC has successfully connected to the ISC.

The screenshot displays the 'IO-Comm' configuration page. On the left is a navigation menu with options: LIVE INFO, SETTINGS, MAINTENANCE, EQUIPMENT, IO-COMM (selected), and FAULT. The main content area is divided into several sections:

- Inputs:** Shows Encoder, Infeed PE 0, and Infeed PE 1, each with a status indicator.
- Outputs:** Shows Valves IO-Link with a C1 Port 2 row of 16 indicators (0-15).
- RAW IO:** Shows IO 0 through IO 7 with their respective pin configurations (e.g., IO 0 (C0-Pin4), IO 2 (C1-Pin4), etc.).
- PLC communication:**
 - Life bit: 811 ms
 - Destination update Pre PE: 811 ms
 - Destination update Post PE: 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	0xFFFF	Word out 5	0	0x0000	Word out 9	0	0x0000	Word out 13	0	0x0000
Word out 2	65527	0xFFFF	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
- Advanced settings:** A toggle switch for 'Advanced' is currently turned off.

At the bottom, status information includes: © Intralox 2024, IDL V2_0240, S7000 ARB Switch, S/N switch 7000, Run Mode Undefined, PLC Connected, IP Address 192.168.1.102, and MAC Address 00:07:46:93:FB:9A.

IO COMM - PLC Communication

TEST RUN

1. Run the Intralox equipment and ISC CAM without products and verify that LED status is correct (See ISC CAM Troubleshooting Guideline for details of the LED Displays), and all the information on the LIVE INFO page and the IO-COMM page are correct.

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

Active carryway information			
End-Off			Throughput 0 ppm
Active carryway 1		Enable 1	Throughput 0 ppm
Active carryway 2		Enable 2	Throughput 0 ppm
Active carryway 3		Enable 3	Throughput 0 ppm

LIVE INFO- Status Active Carryway

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

2. Run the Intralox equipment and 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 or troubleshooting under the following conditions:

- Product trajectory issues, refer to the ISC CAM vHMI Instruction of the equipment technology
- ISC CAM generates faults as viewed on the vHMI (FAULT page)
- Reference the ISC CAM Troubleshooting Guideline as needed.

OPTIMIZE

Once proper functionality of the Intralox equipment has been established, the equipment operation can be optimized for the desired application with the ISC CAM. The ISC CAM provides the capability to set up 8 distinct trajectory patterns for products. These patterns, or “recipes”, can then be selected by the PLC Parent device as needed. See ISC CAM vHMI instruction available [ISC Webpage](#) to set-up recipes and their trajectories.

Recipes

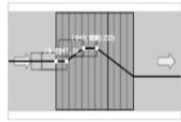
Active recipe 0

Trajectories

Submit

Infeed 1 ->

Destination 2



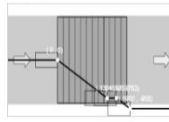
Product tracking point Leading edge

Trigger point 0 mm max: 2500 min: 0 Trigger point 1 mm max: 2500 min: 0 Trigger point 2 mm max: 2500 min: 0 Trigger point 3 mm max: 2500 min: 0

Straight Left Straight Right

Infeed 1 ->

Destination 3



Product tracking point Leading edge

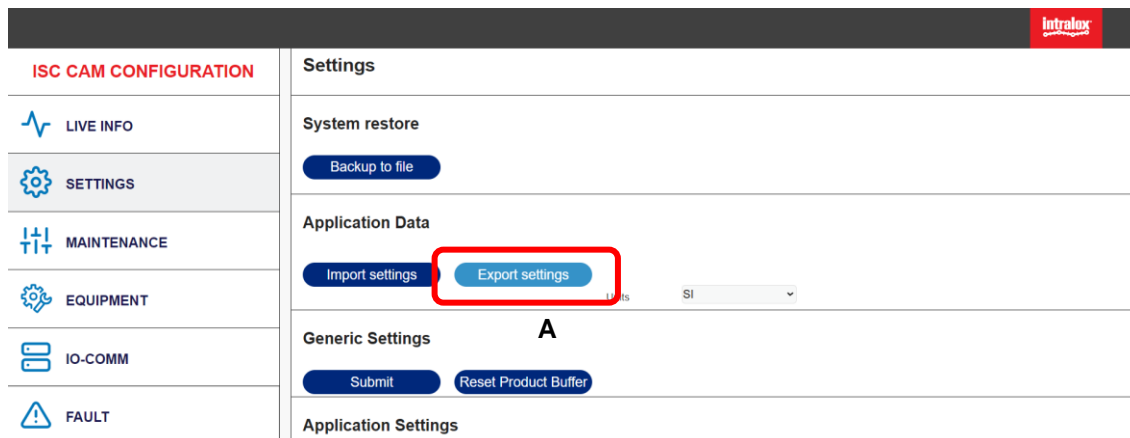
Trigger point 0 mm max: 2500 min: 0 Trigger point 1 mm max: 2500 min: 0 Trigger point 2 mm max: 2500 min: 0 Trigger point 3 mm max: 2500 min: 0

Right Straight Right Straight

SETTINGS - Trajectories and Recipes

BACKUP

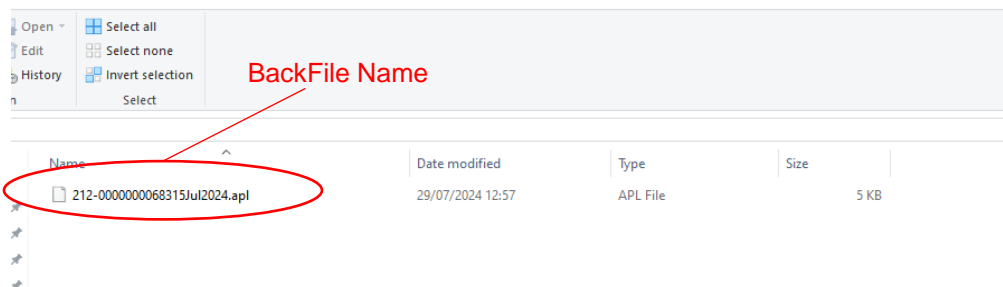
After the commissioning is completed, create a backup of the application settings for possible future use. Create a backup file using the “Export settings” button on the SETTINGS page of the vHMI. Add the backup file to the technical documentation package of the Intralox equipment.



SETTING - Backup application settings

Name the file with the serial number of the Intralox Equipment, and date of export. See example below.

Example: 212-0000000683_2024JUL15.APL



BACKFILE - Example of name

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