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Intended design and use of Virtual HMI

- Virtual HMI (vHMI) facilitates the interaction of non-controls experts with the Intralox equipment for:
  - Commissioning,
  - Adjust key operating parameters,
  - Communicating faults,
  - Communicating basic operating datalogging.
How to use this document

• Additional documents from the Intralox User Manual
  • Mechanical drawing of Intralox Equipment
    • Dimensions of Intralox equipment and position of the components
  • Functional layout drawing of Intralox equipment
    • Application information: product trajectories, belt speeds, min product gaps,
• ISC Interlocks Document
• ISC Troubleshooting Guide
Good to know

• Default IP Address: 192.168.1.254

• IP address displayed on the HMI updates only after reboot of the ISC CAM (power off/on).

• All parameters/values displayed on HMI are available on the ethernet network

• Click on “Submit” button to implement changes on the ‘fly’.

• Units: SI

• IDL: Intralox Divert Logic
Connection to the Virtual HMI
How to connect to the Virtual HMI?

• Connect with a laptop to the ethernet network of the ISC CAM
  • If the ISC CAM is not connected to any ethernet network, connect directly to the ethernet port of the ISC CAM.

• Write the IP address of the ISC CAM on the navigation bar of an internet browser such as Microsoft Edge, Google Chrome, Mozilla Firefox or similar.
  • If the IP address of the ISC CAM is unknown, please request it to the responsible/manager of PLC network or use the Intralox Service Tool available on www.Intralox.com/isccam for identification
  • Default IP address: 192.168.1.254
HMI Overview
Pages

The Virtual HMI:

- Live info
- Settings
- Maintenance
- Equipment
- IO-Communication
- Faults
Interface Overview

1. Navigation panel
   - IP Address of ISC CAM
   - MAC Address: Electronics unique identifier
   - SW Version: Intralox Divert Logic Version
   - DPE Model: Intralox Product Family
   - S/N: serial number of the Intralox equipment

2. Bottom Information Bar
   - Page Unique Information: This is the main page of the HMI, different information will be displayed on this page depending on the selected page.

3. Page Unique Information
   - Live bit: This “light” will flash green when PLC connectivity is activated and is sending live bit.
1. Live page
End in Mind

Provide an overview of the status of Intralox equipment using real-time operating data. The data is generated from the field components:

- Infeed PE (infeed photo eye),
- encoder,
- solenoids valves.

Intended users:
Equipment operator, controls-engineers, maintenance technicians.

‘Read only’ page
Live Info – Indicators

System
General system status.

Belt
Status of the belt.

Infeed Sensor
Status of bending PE.

Gap
Status of gap between 2 consecutive products measured by the Infeed PE.

See troubleshooting guideline.
**Live Info – Indicators**

**Throughput**
Number of products crossing the Infeed PE in the last minute, updated every minute. (not instantaneously)

**Belt Speed**

**Run Time**
Time duration since ISC CAM is powered on for the first time. It only increases when the belt is moving. (receiving encoder pulses)

**Up Time**
Time duration since the ISC CAM was last time powered on.

**Belt Usage**
Total distance travelled by the belt since first encoder pulse.

**Gap Fault**
Total number of ‘Gap Not OK’ since the first encoder pulse. See page faults for definition of GAP not “OK”.

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![Image of Live Info Indicators](image-url)
Live Info – Divert Information

ON/OFF button
ON: Available to divert products
OFF: Not available to divert products

When divert is “OFF” the ISC CAM would not activate this exit even if the LINE PLC indicates it.

Use the “OFF” button when a zone needs to be temporarily unavailable.

Activations
Total number of diverts since first encoder pulse received by the ISC CAM.
Average per Minute:
Products diverted in the last minute.

Destination Next Product
Destination assigned to next product crossing the Infeed PE.

Current Gap at Infeed
Gap measured by Infeed PE between the last two products.
Default gap displayed is the length of the Intralox conveyor.

Minimal Gap at Infeed
Minimal required distance between 2 products for the Intralox equipment to operate correctly. See functional Layout and ISC Troubleshooting guideline.
2. Settings Page
End in Mind

Provides the ability to modify key operating parameters (settings) of the Intralox equipment to optimize the trajectory of products.

**Intended users:**
Technical operators, Ex. maintenance technicians.

‘Read and Write’.

Option to import and export ‘Application setting files’
Setting General

Import Data Button
Import a backup of the application settings from file. (extension “.apl”). Ex: factory setting

Export Setting Button
Creates a backup of the application settings to file

Internal Count 0, 1 and 2 [Write]
Slugs/Train functionality. Number of products allocated to divert #. Only applicable when ISC CAM is working in “Internal Model”, see HMI Page “Equipment”. Nominal range 0..255

Min Product Length [Write]
Minimum distance the infeed PE signal must be stable, to be accepted as product read. Shorter distances will be considered ‘noise’ or “product debris” such as tape of shrink plastic. Nominal range 25mm..75mm

PE Position Offset [Write]
Infeed PE distance from the location specified in “PE position” the “EQUIPMENT” page. Nominal value 0mm

Default Destination [Write]
Destination of product when no signal is received from the Line PLC (external mode) or no slugs/train function is set (internal mode). Nominal value 0

Retain Divert [Write]
Divert activation changes when product needs change direction

Click “Submit” button to implement changes
**Setting General Area 1 & 2**

**Divert Offset [Write]**
Use to define when the Peg engagement with the product. Use negative values to delayed the engagement and positive values to advance the activation.

See Video “How to optimize peg engagement and product orientation for AIM”

Nominal range -150mm..150mm
Multiples of 50mm (2inch)

**Activation Delay Override [Write]**
Activation: Valve ON

Activation Delay: This value compensates for mechanical delays during activation of the activation system of the Intralox equipment.
Override: sets a new delay. Nominal range 0/(default)/35ms..85ms

**De-activation Delay Override [Write]**
Override: sets a new delay. Valve OFF
De-Activation Delay: This value compensates for mechanical delays during de-activation of the activation system of the Intralox equipment.
Override: sets a new delay. Nominal range 0/(default)/35ms..85ms

Click “Submit” button to implement changes
3. Maintenance Page
End in Mind

Display the ‘equipment log’ with absolute counter values

Intended users: Maintenance technicians

‘Read only’

Ability to export counter files.
## Maintenance

### Up time
Time elapsed since the ISC CAM was powered on. It resets to zero when the ISC CAM is powered off.

### Belt Run Time
Time elapsed since the ISC CAM received the first encoder pulse. It only increments when the ISC CAM receives encoder pulses. It never resets to zero.

### Belt Usage
Total distance travelled by the belt since first encoder pulse. It never resets to zero.

### Product Count
Total count number of products that passed the Infeed PE (absolute value) since first encoder pulse.

### GAP Fault Count
Total number of ‘Gap Not OK’ since the first encoder pulse. See page faults for definition of GAP not “OK”.

### Divert count
Total number of activations of each divert since first encoder pulse.

<table>
<thead>
<tr>
<th>Counters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up Time:</td>
<td>0 hrs</td>
</tr>
<tr>
<td>Belt Run Time:</td>
<td>0 hrs</td>
</tr>
<tr>
<td>Belt Usage:</td>
<td>0 km</td>
</tr>
<tr>
<td>Product Count:</td>
<td>157</td>
</tr>
<tr>
<td>GAP Fault Count:</td>
<td>0</td>
</tr>
<tr>
<td>Divert 1 Count:</td>
<td>0</td>
</tr>
<tr>
<td>Divert 2 Count:</td>
<td>0</td>
</tr>
</tbody>
</table>
4. Equipment Page
End in Mind

Ability to modify key operating parameters (settings) of the Intralox equipment to optimise the trajectory of products.

Intended users: Controls engineers, Maintenance operators.

‘Read and write’

Options to import Intralox equipment mechanical dimensions
Equipment - Application Data

**Application [Read only]**
Type of functionality that the Intralox equipment is performing when diverting products: Sorter or Switch

**Activation Type [Read only]**
Type of mechanical activation mechanism used for engaging with Intralox belt for diverting products: S45X0, S70X0 or AIM

**Minimum Gap [Read only]**
Minimal required distance between 2 products for the Intralox equipment to operate correctly. See Functional Layout

**Hardwired Signal [Read only]**
Hardwire signal "enable" results that ONLY the 1st divert reacts to the discrete signal of 24VDC to activate. The discrete signal has priority over the ethernet signal. Use hardware signal when the Intralox equipment has a high-speed reject

**Run Mode [Write]**

- **Internal Mode:** ISC CAM operates in autonomous mode with an internal counter for diverting products
- **External Mode:** ISC CAM requires the input signal from the Line PLC for diverting (or not) each product.

**Sensor Mode [Write]**
Applicable to Infeed PE.
Default: LIGHT MODE

**Fault Override [Write]**
Mask - Selection: number, overrides faults. See HMI Page "Faults".
Equipment – Belt Data

Conveyor Length [Read only]
Length in [mm] of the frame of the Intralox equipment.

Belt width [Read only]

Sprocket Teeth [Read only]
Number of teeth of the sprocket

Pitch [Read only]
Length of the module of the belt.

Encoder Resolution [Read only]
Number of pulses generated by the encoder per revolution. Default = 64 pulse/rev

Belt Travel/pulse [Read only]
Conversion of the belt travel distance in [1/10 mm] for each encoder pulse. Dependant of the belt pitch

Maximum Speed [Read only]
Recommended maximum belt speed of the Intralox equipment. Functional Layout.

Minimum Speed [Read only]
Recommended minimum belt speed of Intralox equipment. Functional Layout

Click “Submit” button to implement changes
Equipment – Divert Data AIM

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divert Area Count [Read only]</td>
<td>Area # starts counting from the Zero Position. See image in next pages.</td>
</tr>
<tr>
<td>Zone Length [Read only]</td>
<td>Length of the divert zone</td>
</tr>
<tr>
<td>Inf Sensor Count [Read only]</td>
<td>Number of Infeed PE.</td>
</tr>
<tr>
<td>PE Position [Read only]</td>
<td>Infeed PE distance from the Zero Position.</td>
</tr>
<tr>
<td>Position [Read only]</td>
<td>Start of divert area distance from the Zero Position.</td>
</tr>
<tr>
<td>Activation Delay [Read only]</td>
<td>Standard mechanical activation delay between a signal is received by the ISC CAM and the product starts moving on the belt.</td>
</tr>
<tr>
<td>De-activation Delay [Read only]</td>
<td>Standard mechanical de-activation delay between a signal is given by the ISC CAM and the equipment reacts.</td>
</tr>
<tr>
<td>Peg Sensor Offset [Read only]</td>
<td>Distance between the Peg Sensor and AIM activation mechanism.</td>
</tr>
</tbody>
</table>

Click “Submit” button to implement changes.
AIM Sorter Application

AIM Switch is equivalent to an AIM Sorter of 1 divert.
5.IO-COMM Page
End in Mind

Detail the communication status between the ISC CAM with the field components and the line PLC. Please refer to the ISC CAM Interlocks Document for additional information and ISC Troubleshooting document actions.

Intended users: Line control engineers

‘Read only’
## IO-COMM Status

**Encoder**
Status of encoder, blinking with each pulse with screen updates every 0.5 second.

**Infeed PE**
Status of Infeed PE.
"Block": beam is blocked.
Screen updates every 0.5 second.

**Reject Signal**
Input status of hardwire reject signal

**Peg Sensor 1**
Only applicable for AIM applications. Status of peg sensor of divert 1, blinking with each peg passing the beam the peg sensor (belt movement required)
Screen updates every 0.5 second.

**Peg Sensor 2**
Only applicable for AIM applications with 2 diverts. Status of peg sensor of divert 2, blinking with each peg passing the beam the peg sensor (belt movement required)
Screen updates every 0.5 second.

### Hardware Input Status

<table>
<thead>
<tr>
<th>Encoder</th>
<th>Infeed PE</th>
<th>Reject Signal</th>
<th>Peg Sensor 1</th>
<th>Peg Sensor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinking</td>
<td>Blinking</td>
<td>Blinking</td>
<td>Blinking</td>
<td>Blinking</td>
</tr>
</tbody>
</table>

### IO-Link Output Status

<table>
<thead>
<tr>
<th>Output Port 1 Value</th>
<th>Output Port 2 Value</th>
<th>Valve 1</th>
<th>Valve 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

### Communication Input Words (From PLC to ISC)

| WORD 00: | 0 |
| WORD 01: | 0 |
| WORD 02: | 0 |
| WORD 03: | 0 |
| WORD 04: | 0 |
| WORD 05: | 0 |

| WORD 06: | 0 |
| WORD 07: | 0 |
| WORD 08: | 0 |
| WORD 09: | 0 |
| WORD 10: | 0 |
| WORD 11: | 0 |

| WORD 12: | 0 |
| WORD 13: | 0 |
| WORD 14: | 0 |
| WORD 15: | 0 |

### Communication Output Words (From ISC To PLC)

| WORD 00: | 18 |
| WORD 01: | 6635 |
| WORD 02: | 0 |
| WORD 03: | 1 |
| WORD 04: | 4 |
| WORD 05: | 15 |

| WORD 06: | 233 |
| WORD 07: | 0 |
| WORD 08: | 0 |
| WORD 09: | 0 |
| WORD 10: | 20 |
| WORD 11: | 0 |

| WORD 12: | 0 |
| WORD 13: | 0 |
| WORD 14: | 0 |
| WORD 15: | 0 |
IO-COMM Status

IO-Link Output Status
Out Port 1 valve
Only applicable to S70X0 technology. Status of valve bank.

Out Port 2 valve (optional)
Only applicable to S70X0 technology. Status of valve bank.

Hardware Output Status
Valve 1
Only applicable to S45X0 and AIM technology
OFF: valve is off
ON: valve is on.

Valve 2 (optional)
Only applicable to S45X0 and AIM technology
OFF: valve is off
ON: valve is on.
Words sent by the ISC CAM to the Line PLC through the ethernet network.

See ISC CAM Interlocks file on ISC Webpage
IO-COMM Output Words

Words received by the ISC CAM from the Line PLC through the ethernet network

See ISC CAM Communication Interlocks file on ISC Webpage.
6. Fault Page
End in Mind

Display the status of the faults generated by the ISC CAM in a human-readable interface.

Refer to the ISC CAM Interlocks Document for details and ISC Troubleshooting document for actions.

Intended users: all users

‘Read only’
Fault 0-7

- **Fault Code 0**: No encoder signal received from encoder.
- **Fault Code 1**: Encoder pulsing but no signal received from Line PLC when motor is ON.
- **Fault Code 2**: Belt speed is slower than minimum recommended speed. See “EQUIPMENT” page and Functional Layout for minimum speed.
- **Fault Code 3**: Belt speed is faster than maximum recommended speed. See “EQUIPMENT” page and Functional Layout for minimum speed.
- **Fault Code 4**: Infeed PE blocked, see ISC troubleshooting guide.
- **Fault Code 5**: Optional. See Functional Layout for configuration of Intralox Equipment.
- **Fault Code 6**: Optional. See Functional Layout for configuration of Intralox Equipment.
- **Fault Code 7**: Only applicable to AIM technology. Peg sensor(s) 1 or 2 (if applicable) blocked, see ISC troubleshooting guide.
Fault_code_8
Only applicable to AIM Technology Peg missing in the belt.

Fault Code 9
See MIN GAP value in “EQUIPMENT” page.

Fault Code 10
Power supply low voltage. See ISC troubleshooting guide.

Fault Code 11
Current draw too high, see ISC troubleshooting guide.

Fault Code 12
Only applicable to S70x0 Technology with valve banks.
Optional. See Functional Layout for configuration of Intralox equipment

Fault Code 13
Only applicable to S70x0 Technology with valve banks. Optional. See Functional Layout for configuration of Intralox equipment and ISC troubleshooting guide.

Fault Code 14
Only applicable to S70x0 Technology with valve banks. Optional. See Functional Layout for configuration of Intralox equipment, and ISC troubleshooting guide.

Fault Code 15
Only applicable to S70x0 Technology with valve banks. Optional. See Functional Layout for configuration of Intralox equipment and ISC troubleshooting guide.