Virtual HMI User Instructions

ISC CAM AIM Technology

Version 1.0

23 April 2021

Table of Contents

Intended design and use of Virtual HMI

- Virtual HMI facilitates the interaction of non-controls experts with the Intralox equipment to:
    - commission,
    - adjust key operating parameters,
    - communicate faults,
    - communicate basic operating log data.

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).
- Click on “Submit” button to implement changes on the ‘fly’.
- Units: SI
- All parameters/values displayed on HMI are available on the ethernet network

Connection to the Virtual HMI

How to connect to the Virtual HMI?

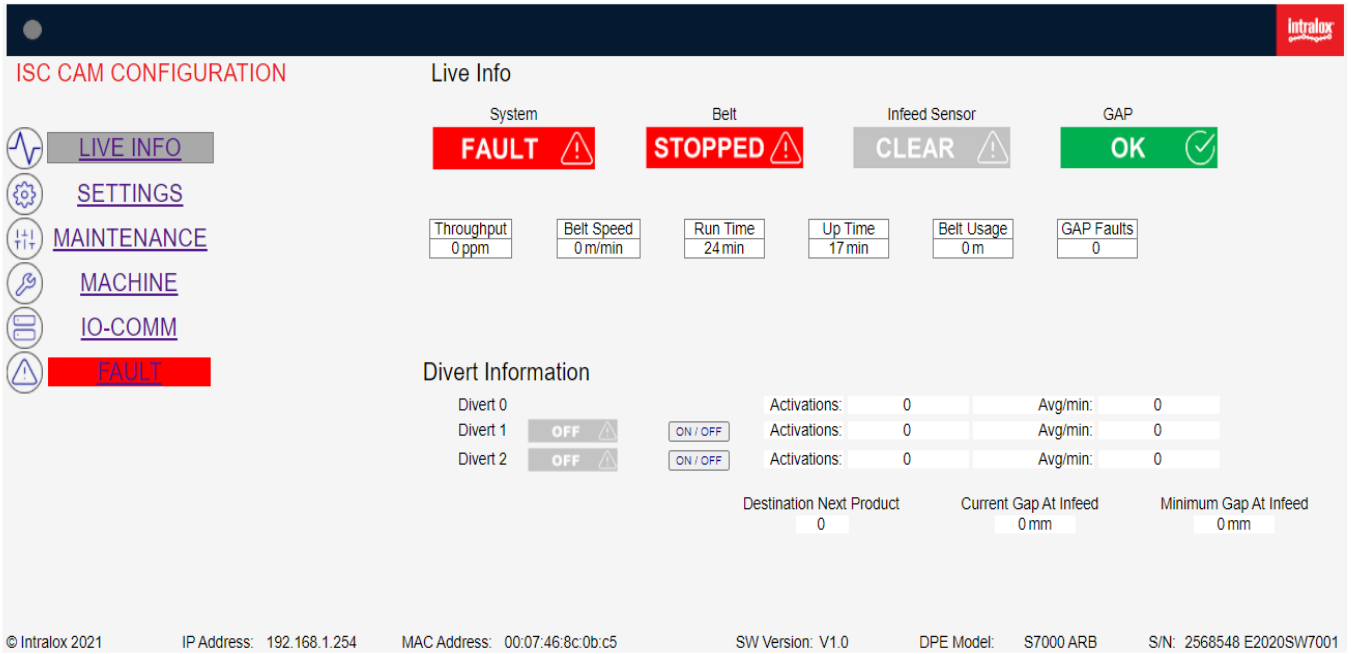
- Connect with a laptop to the ethernet network of the ISC CAM
  - If the ISC CAM is not connected to any ethernet, connect directly to the ethernet port of the ISC CAM.

- 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.
  - Default IP address: 192.168.1.254

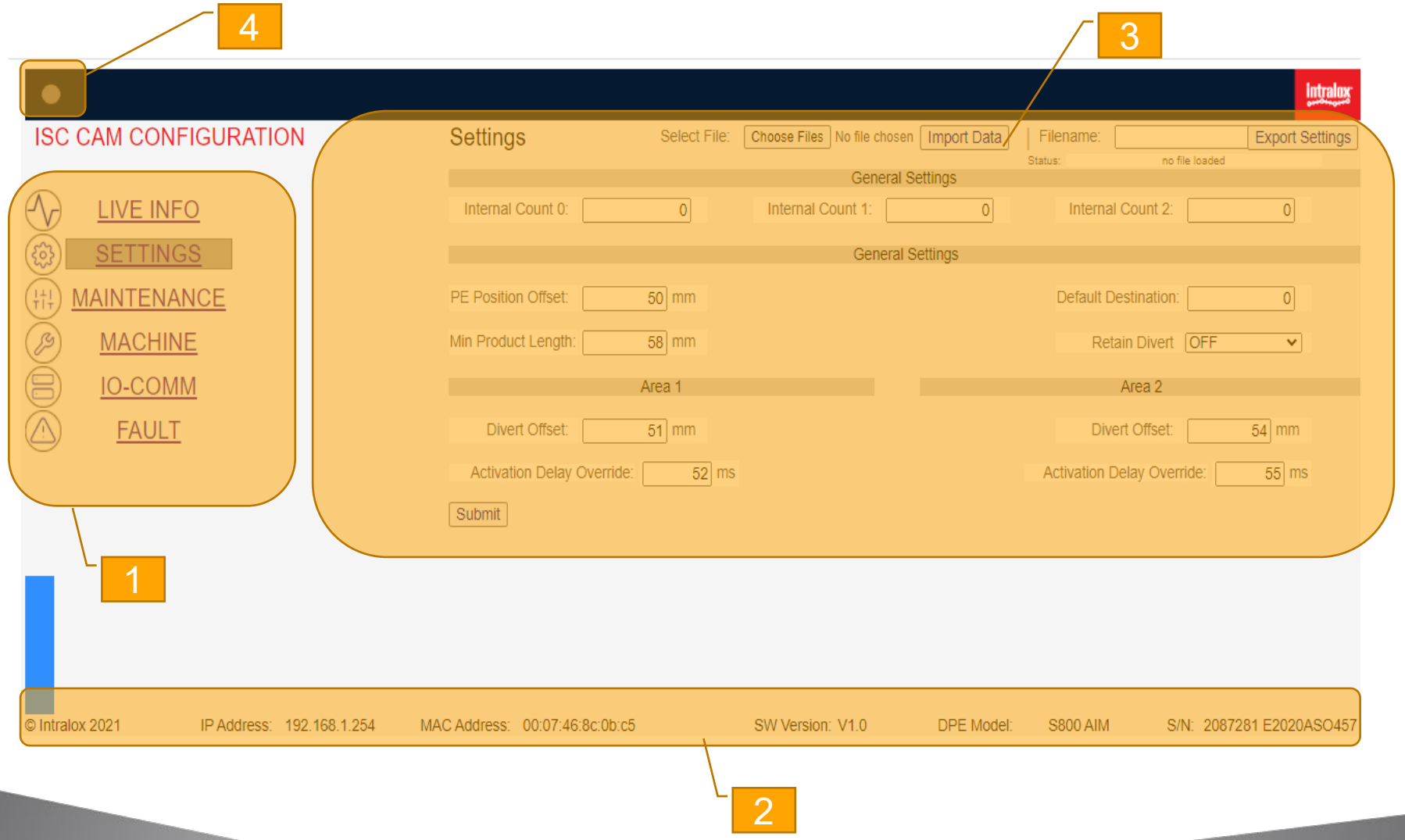
HMI Overview

Number of pages & high level Description

- The Virtual HMI has 6 different pages
  1. Live: landing page
  2. Settings
  3. Maintenance
  4. Machine
  5. IO-Communication
  6. Faults

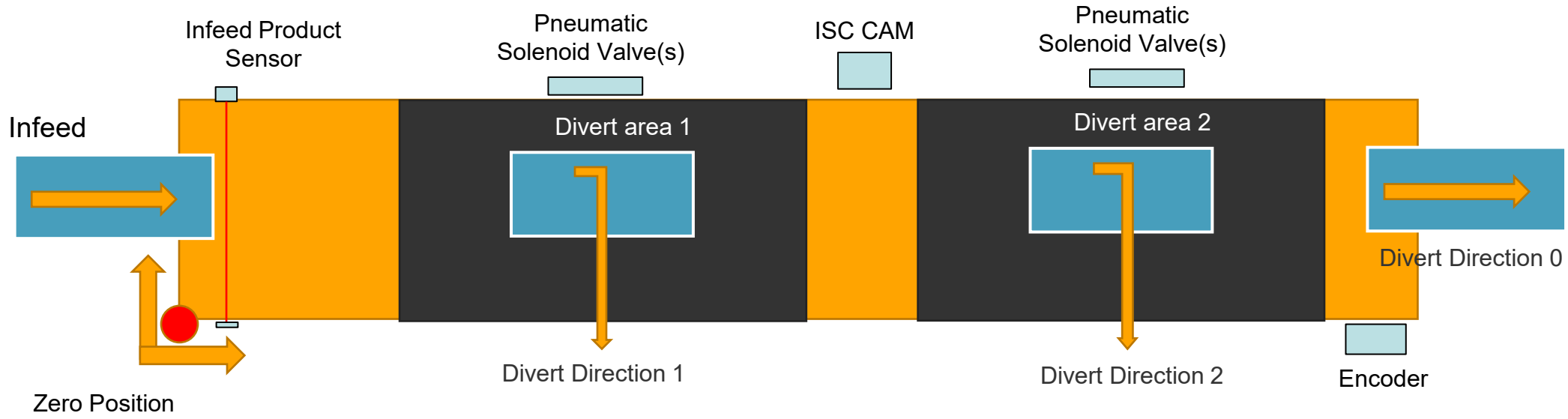


Interface Overview



1. Navigation pannel
   - Live Info
   - Settings
   - Maintenance
   - Machine
   - IO-COMM
   - Fault
2. Bottom Information Bar
   1. IP Address of ISC CAM
   2. MAC Address: electronic unique identifier
   3. SW Version: Intalox Divert Logic Version
   4. DPE Model: Intralox Product Family
   5. S/N: serial number of the Intralox equipment
3. Page Unique Information
4. Live bit

Intralox Equipment

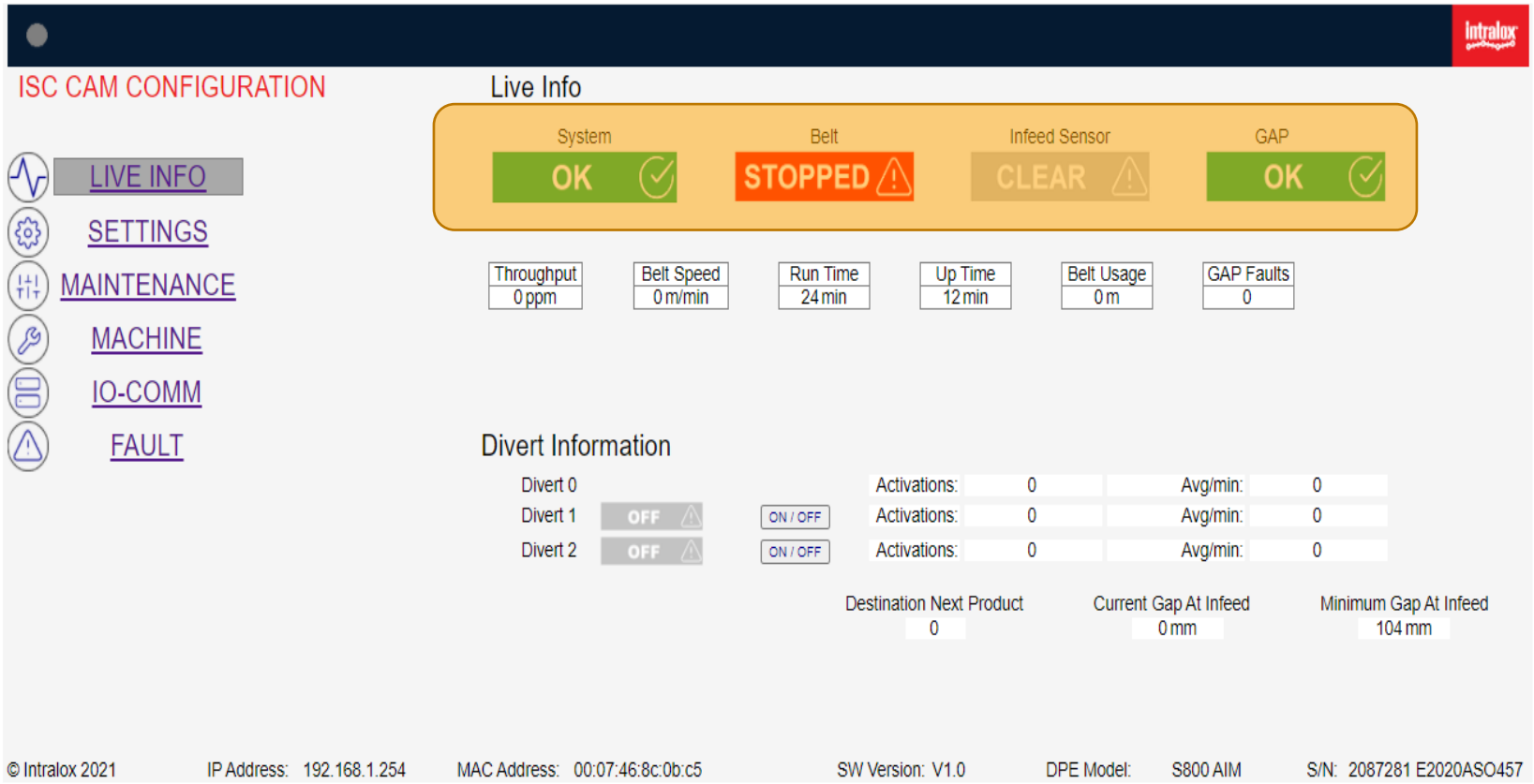


1. Live page

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 product sensor,
  - encoder,
  - solenoids valves
- ‘Read only’ page
- Intended users: Any user such as equipment operator, controls engineers, maintenance tech

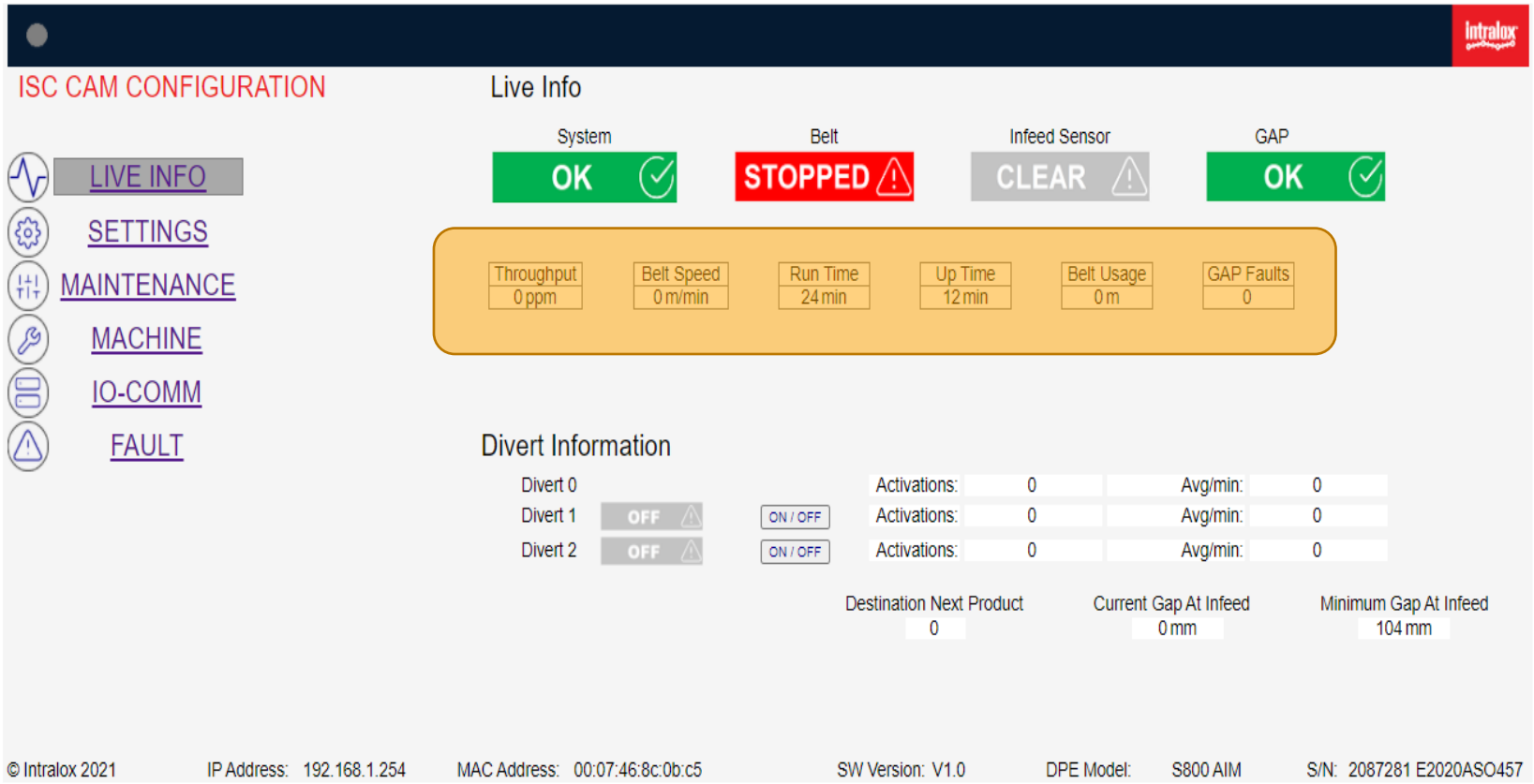
Live Info – Indicators



- **System**
  General status of the system to run
- **Belt**
  Status of the belt.
- **Infeed Sensor**
  Status infeed Product Sensor.
- **Gap**
  Status of gap between 2 consecutive products measured by the infeed product sensor. See page faults for definition of GAP not “OK”.

  Gap shorter than “Min Gap at Infeed” triggers fault signal to PLC. See troubleshooting guideline.

Live Info – Indicators



- **Throughput**

  Number of products crossing the infeed product sensor in the last minute, updated every minute (not instantaneously)

- **Belt Speed**

  Linear belt speed.

- **(Belt) Run Time**

  Time Duration since ISC CAM is powered on 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.

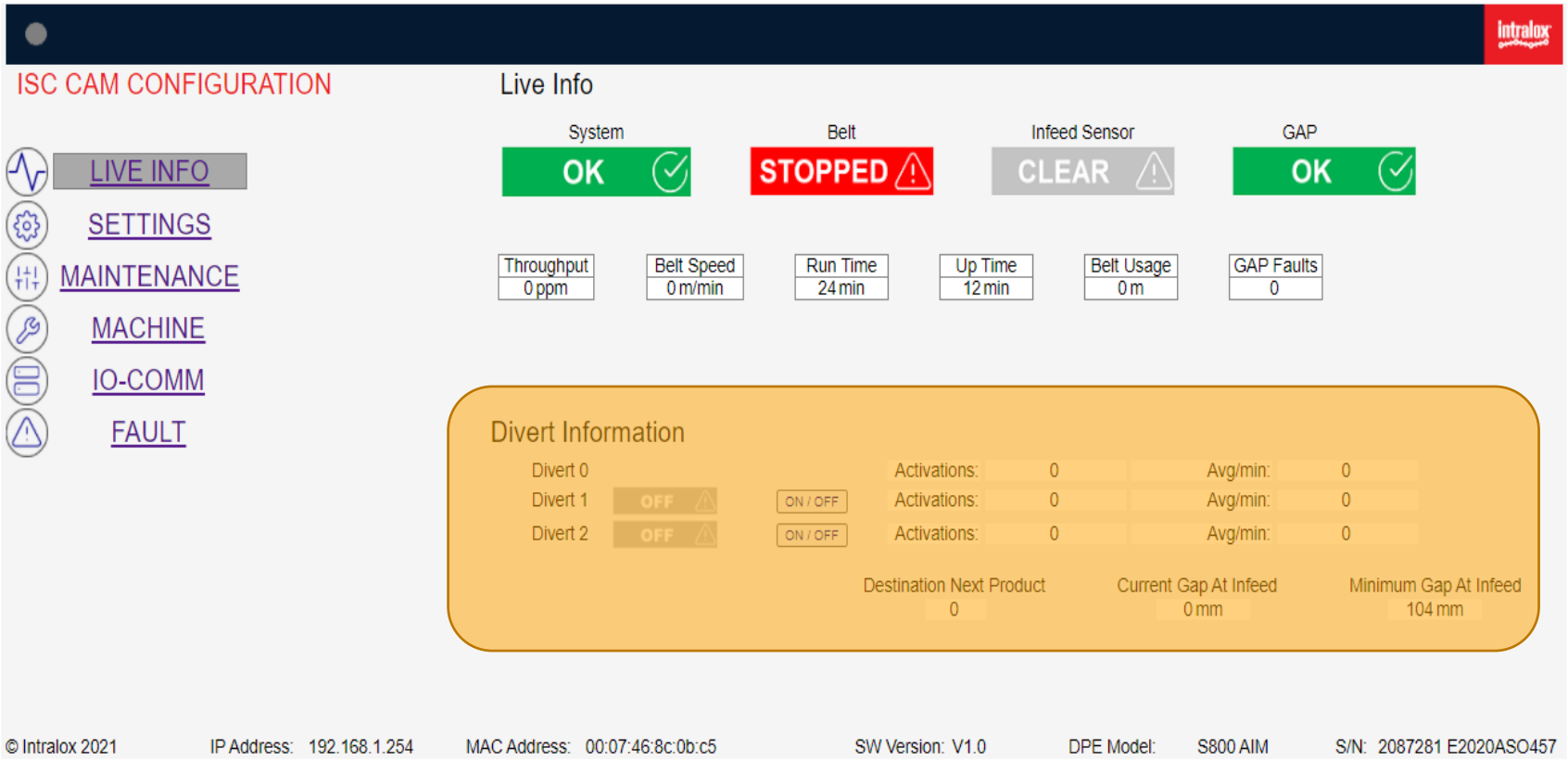
- **Belt Usage**

  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”.

Live Info – Divert Information



- **Divert Number**
  - Zone counting starts from infeed of the Intralox equipment
- **ON/OFF button**
  - ON: zone is available to divert products
  - OFF: zone is not available to divert products
  - 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. Ex: maintenance task.
- **Activations**
  - Total number of activations of the divert since first encoder pulse received by the ISC CAM (absolute number)
  - Avg per Minute: products crossing the infeed product sensor in the last minute, update every 60 seconds
- **Destination Next Product**
  - Destination assigned to next product crossing the Infeed Product Sensor.
- **Current Gap at Infeed**
  - Gap measured by Infeed Product sensor between 2 products. Max gap displayed is the length of the Intralox conveyor.
- **Minimal Gap at Infeed**
  - Minimal required gap between 2 products for the Intralox equipment to operate correctly. Functional Layout and ISC Troubleshooting guideline.

2. Settings Page

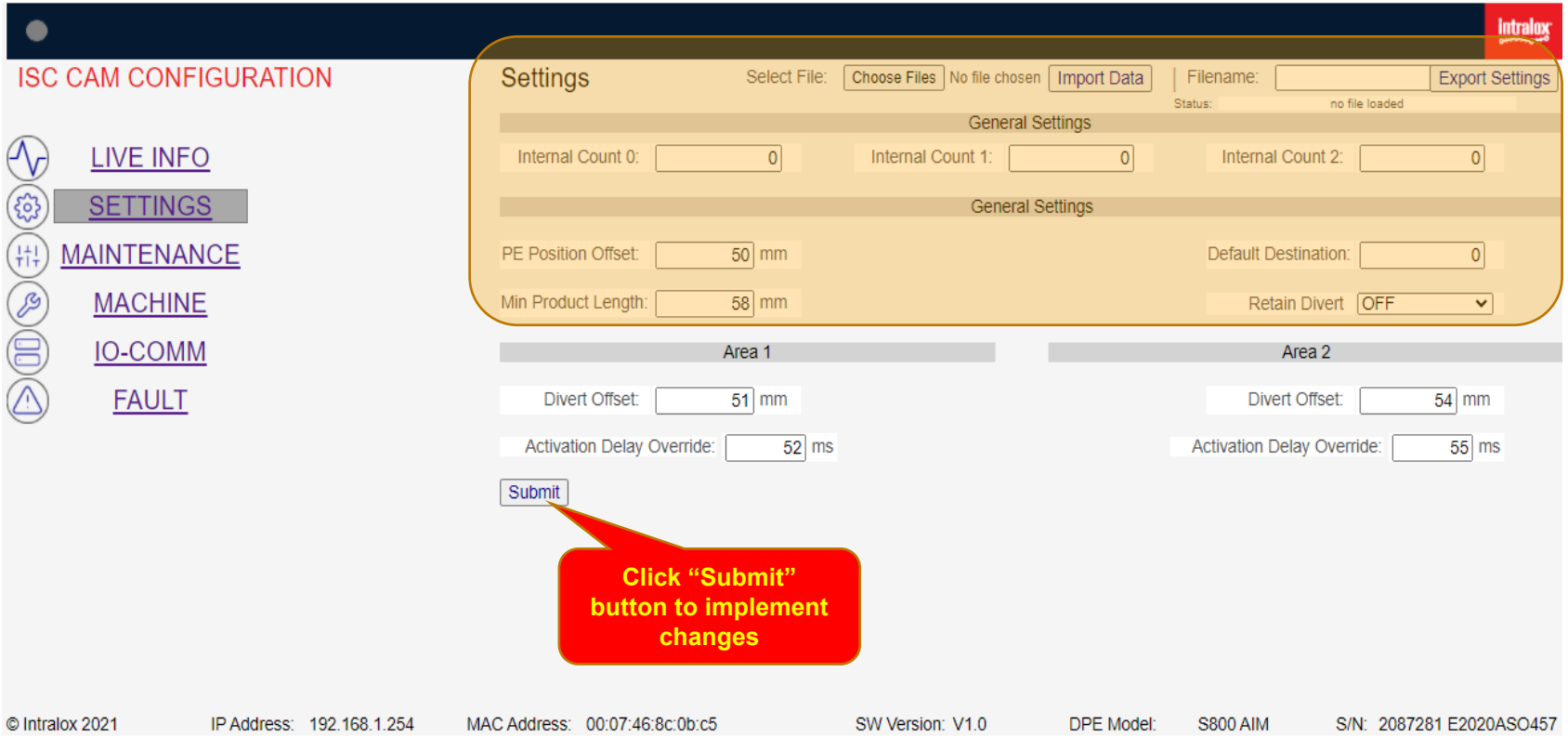
Setting: End in Mind

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

- ‘Read and Write’. Option to import and export ‘Application setting files’

- Intended users
  - Technical operators looking for adjusting the performance of the Intralox equipment. Ex. maintenance tech

Setting General



- **Import Setting Button**

  Import to the ISC CAM backup application setting files to (extension ".apl"). Ex: factory setting

- **Export Data Button**

  Export application setting files to generate backup

- **Internal Count 0, 1 and 2**

  Slugs/Train functionality. Number of products allocated to divert #. Only applicable when ISC CAM is working in "Internal Model", see HMI Page "Machine".

- **Min Product Length**

  Minimum product length configured for this Intralox equipment. See Functional Layout

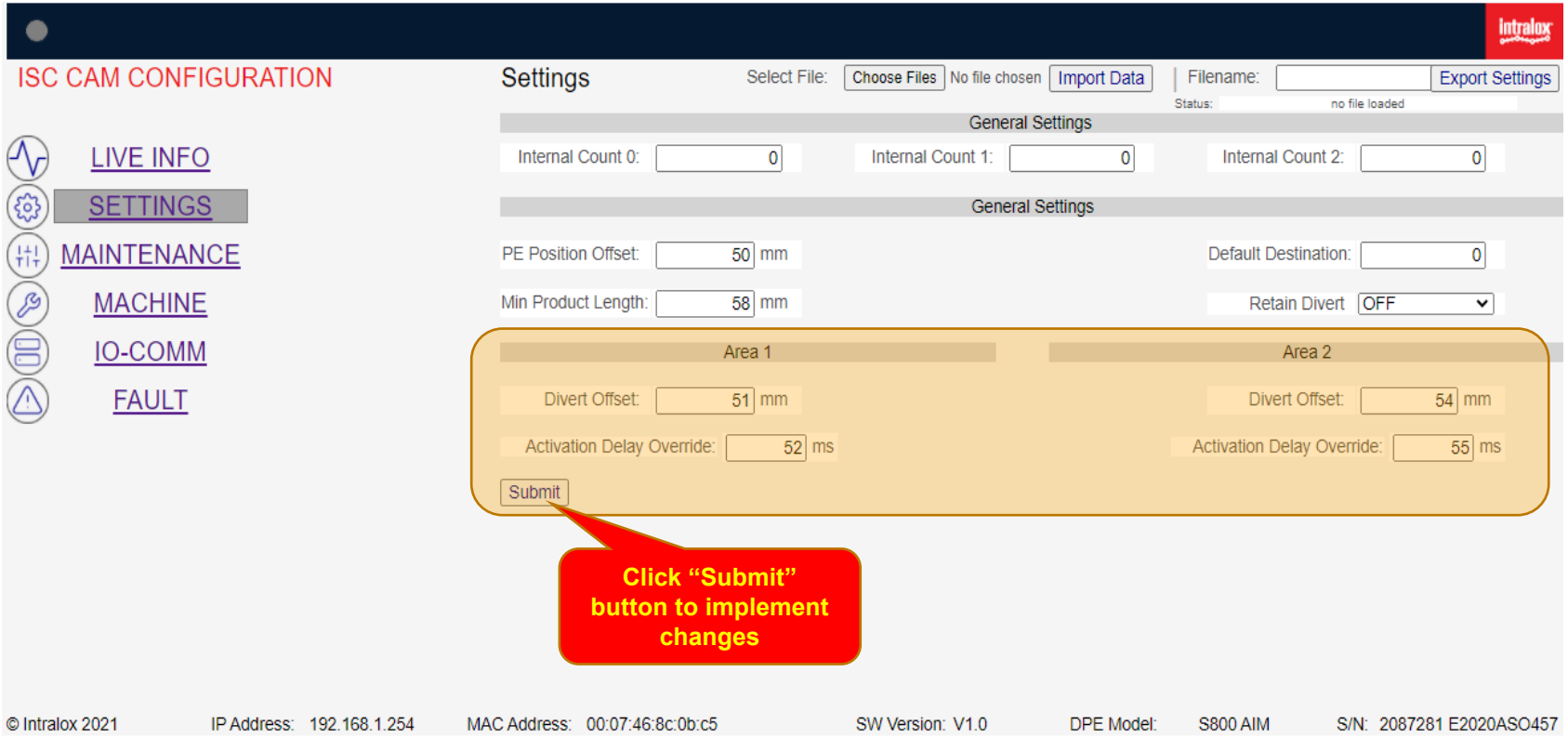
- **PE Position OffSet**

  Infeed Product Sensor distance from the Zero Position. See Mechanical Drawing.

- **Default Destination**

  Destination of product when no signal is received from the Line PLC (external mode) or no slugs/train function is set (internal mode)

Setting General



- **Divert OffSet**

  (Start of) divert area distance from the position defined by Intralox. See Mechanical Drawing of position.

- **Activation Delay Override**

  This value considers mechanical delays of the activation system of the Intralox equipment from product detection until product starts moving on the belt.

- **SUBMIT BUTTON**

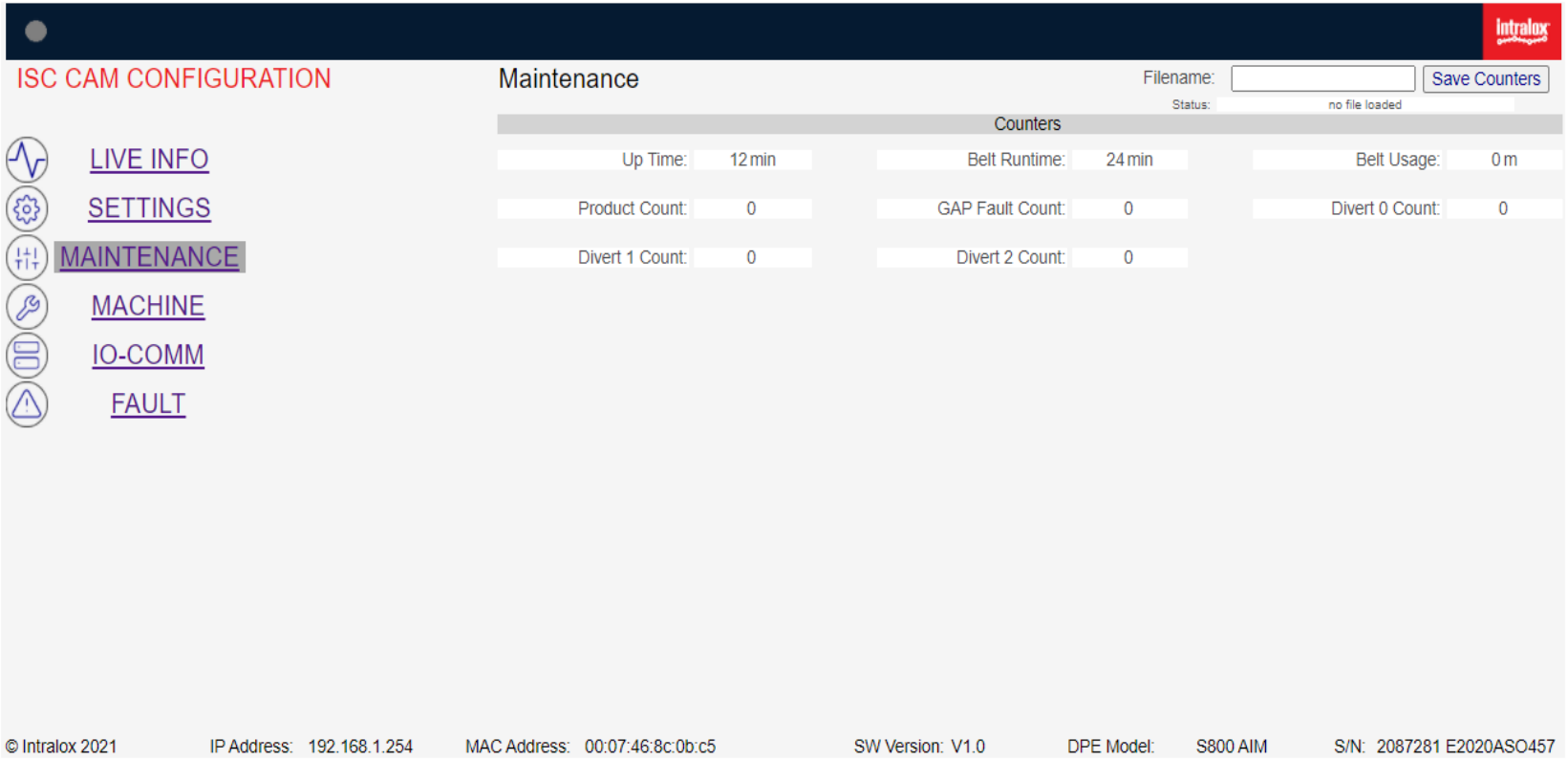
  Click button for making the modifications on the ISC CAM firmware effective.

3. Maintenance Page

End in Mind

- Display the ‘equipment log’ with absolute counter values
- ‘Read only’, ability to export counter files.
- Intended users: maintenance.

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 pluses. 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 product sensor (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 0, 1, 2**
  Total number of activations of each divert since first encoder pulse .
- **Save Counters BUTTON**
  Click button to export the counter values. File extension is ‘cnt’ and requires Intralox tool to make it readable.

4. Machine Page

End in Mind

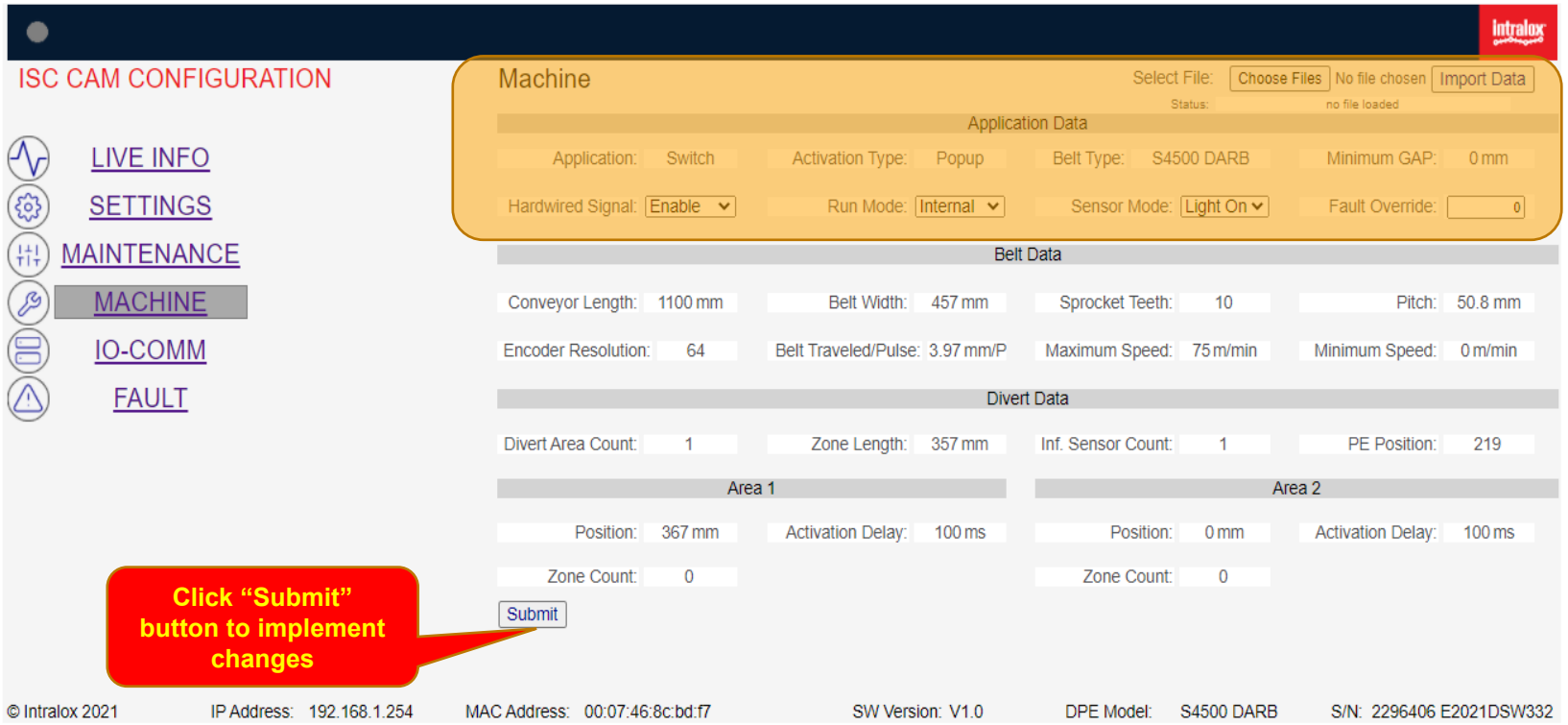
- Ability to modify key operating parameters (settings) of the Intralox equipment to optimise the trajectory of products.

- ‘Read and write’
  - Read: read the Intralox equipment mechanical dimensions relevant for the automation of the carryway
  - Write: upload files with the mechanical dimensions of the Intralox equipment

- Intended users
  - Controls engineers integrating the ISC CAM into the Line network (communication)
  - Maitenance operators troubleshooting

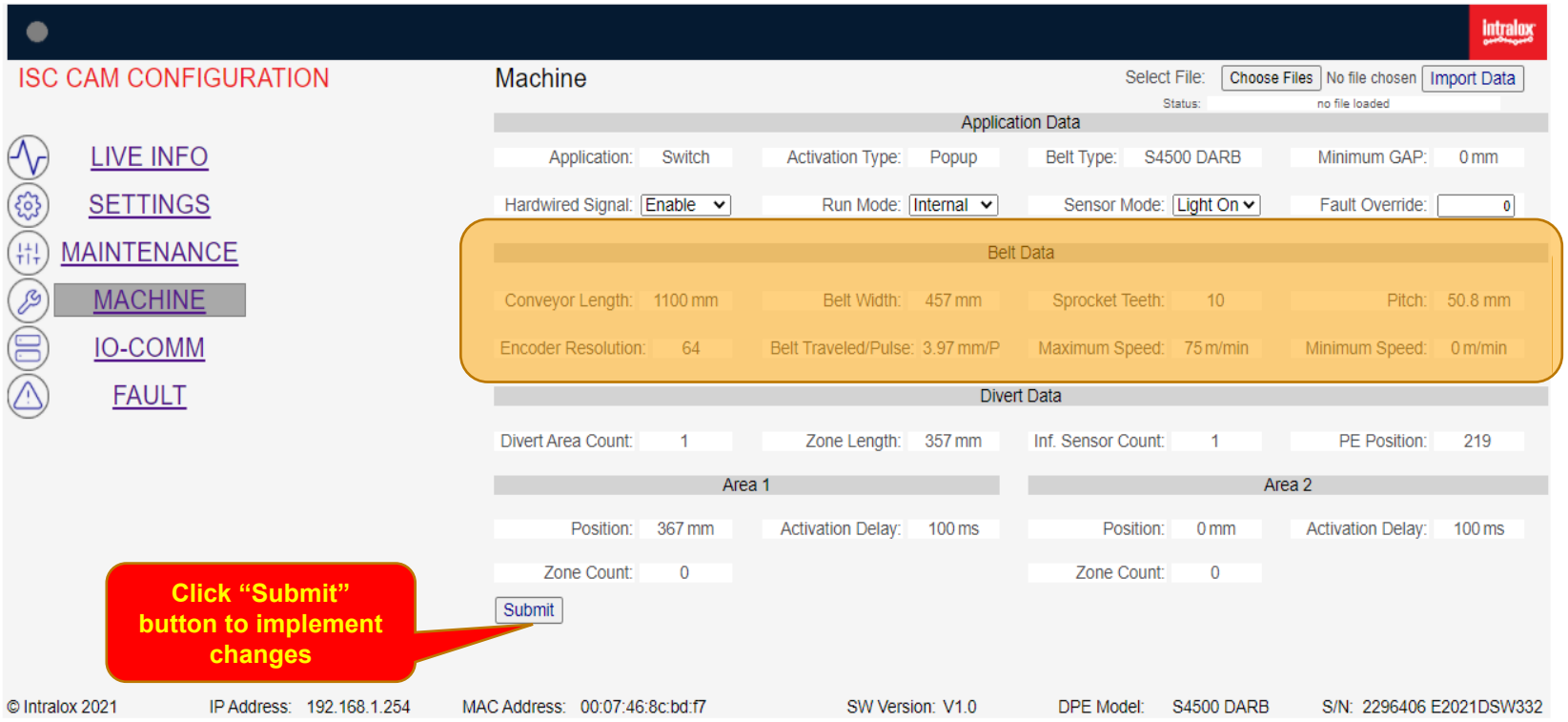
- See Functional Layout and Mechanical Drawing

Machine -Application Data



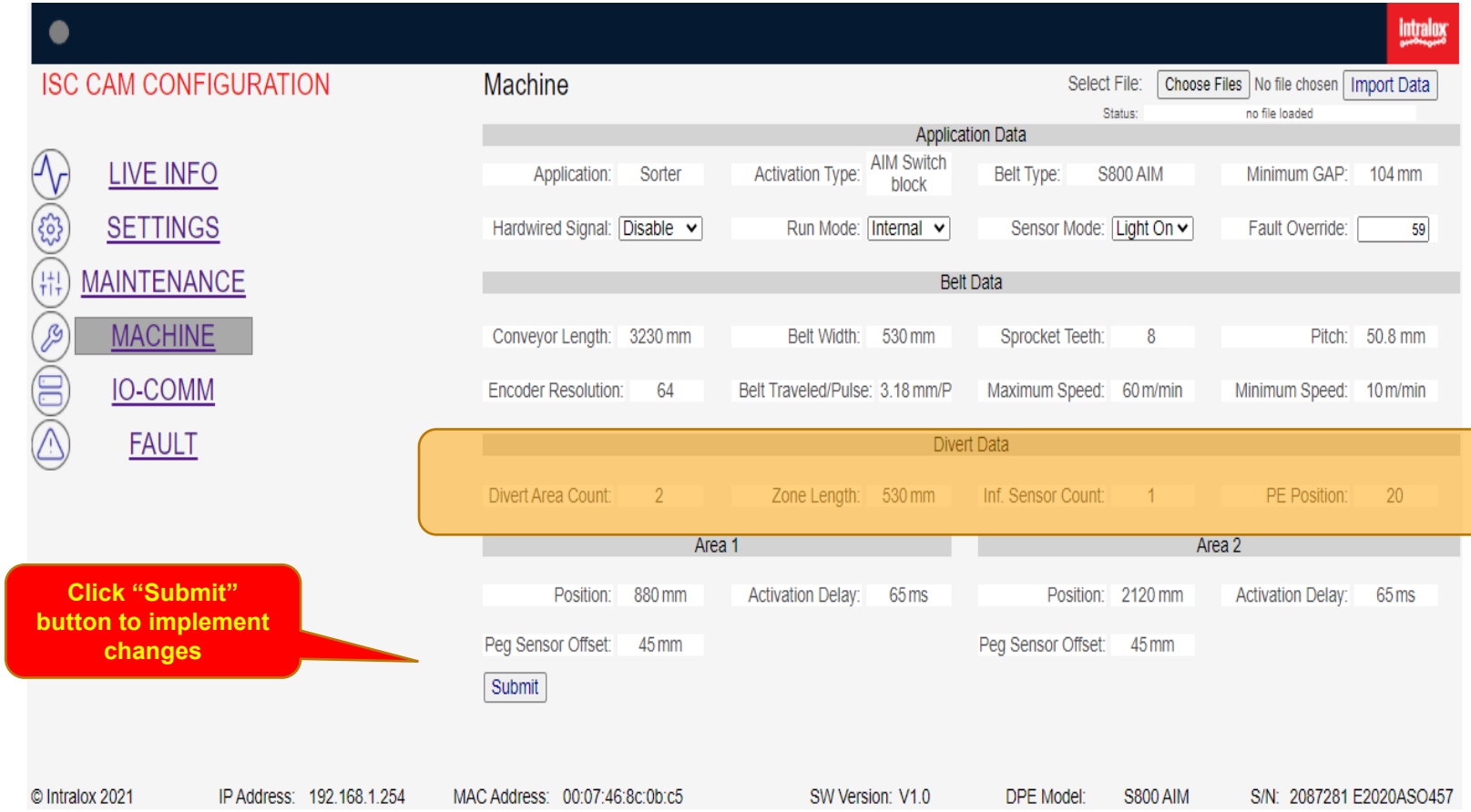
- **Application**
  Type of functionality that the Intralox equipment is performing when diverting products: Sorter or Switch
- **Activation Type**
  Type of mechanical activation mechanism used for engaging with Intralox belt for diverting products: PopUp, RnR or AIM
- **Belt Type**
  Intralox Belt series used in the Intralox equipment.
- **Minimum Gap**
  Minimum distance between products at the infeed of Intralox See Functional Layout
- **Hardware Signal**
  Selections: enable or disable.
  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**
  Selections: Internal or external
  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**
  Selection: Light On / Dark On
  Applicable to infeed product sensor. Use only for replacement
- **Fault Override**
  Selection: number, overrides faults. See HMI Page "Faults".

Machine –Belt Data



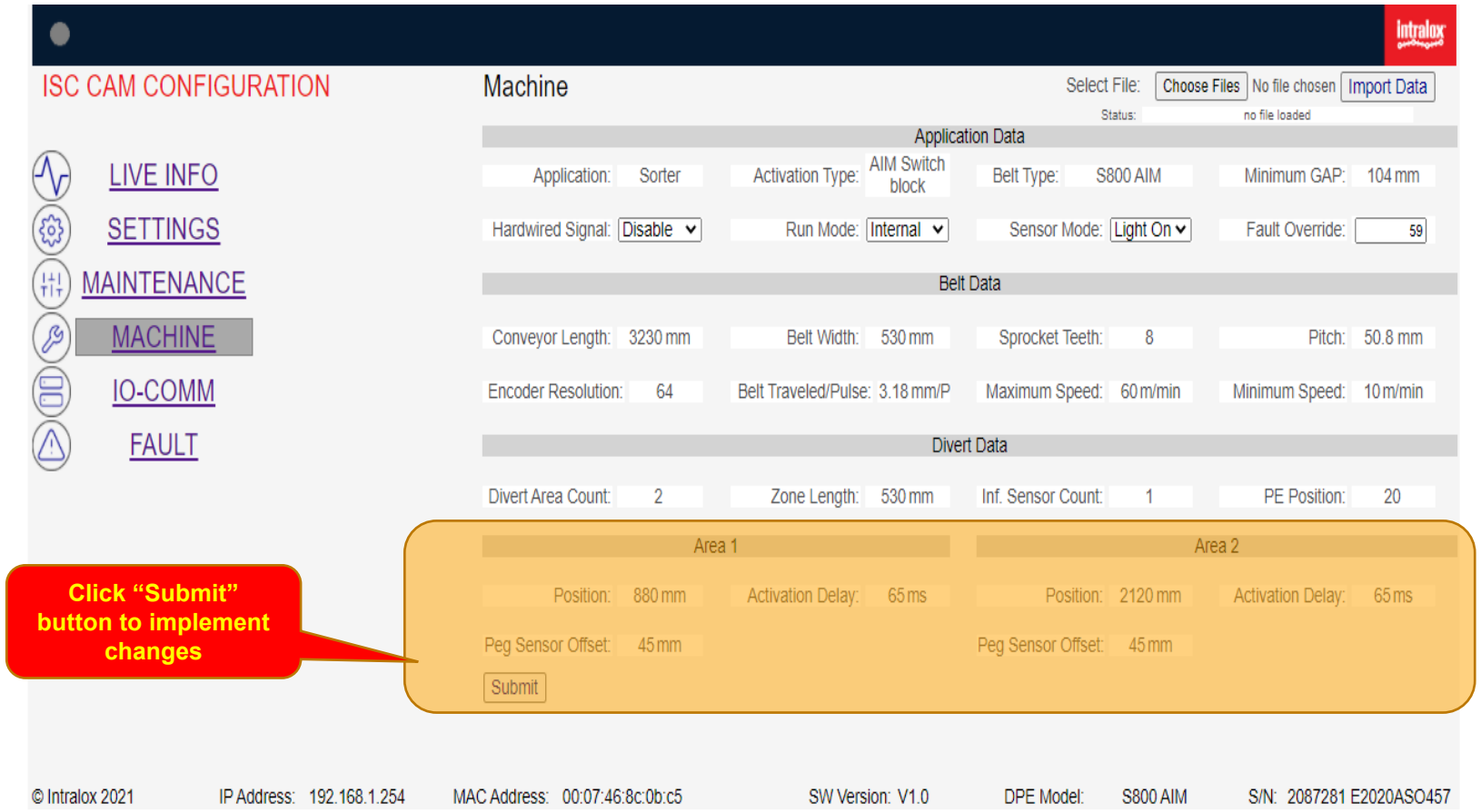
- **Conveyor Length**
  Length in [mm] of the frame of the Intralox equipment.
- **Width**
  Belt width
- **Sprocket Teeth**
  Number of teeth of the sprocket
- **Pitch**
  Length of the module of the belt.
- **Encoder Resolution**
  Number of pulses generated by the encoder per revolution. Standard = 64 pulse/rev
- **Belt Travel/pulse**
  Conversion of the belt travel distance in [1/10mm] for each encoder pulse. Dependant of the belt pitch
- **Maximum Speed**
  Recommended Maximum belt speed of the Intralox equipment. Functional Layout.
- **Minimum Speed**
  Recommended minimum belt speed of Intralox equipment. Functional Layout

Machine – Divert Data



- Divert Area Count
  - Area # starts from infeed of the Intralox equipment. See image in next page.
- Zone Length
  - Length of the divert zone
- Inf Sensor Count
  - Number of Infeed product sensor.
- PE Position
  - Infeed Product Sensor distance from the Zero Position.

Machine - Area



- **Position**

  (Start of) divert area distance from the Zero Position.

- **Activation Delay**

  Standard mechanical activation delay between a signal is received by the ISC CAM and the product starts moving on the belt.

- **Peg Sensor OffSet**

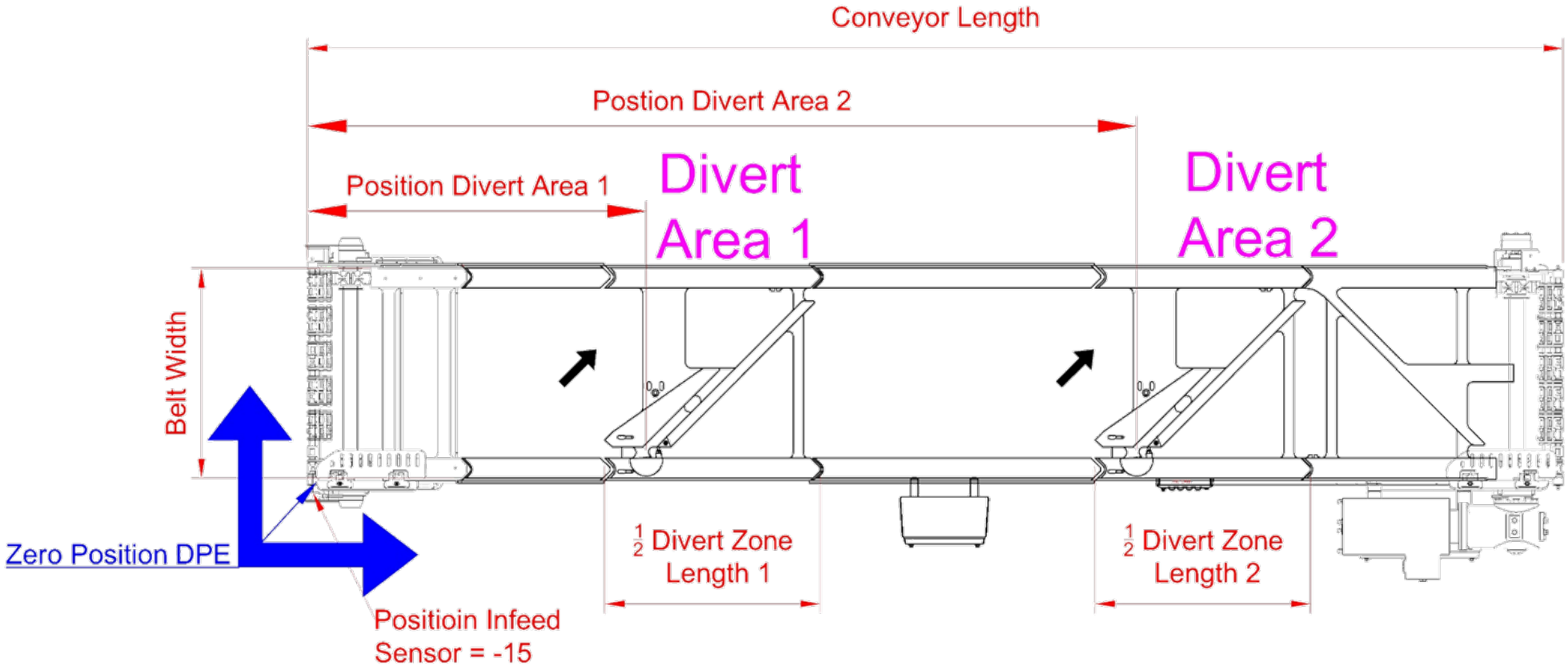
  Peg sensor distance from Zero Position

- **SUBMIT BUTTON**

  Push button for making the modifications in the ISC CAM firmware effective.

- **NOTE: Area 2 is optional**

AIM Technology



5.IO-COMM Page

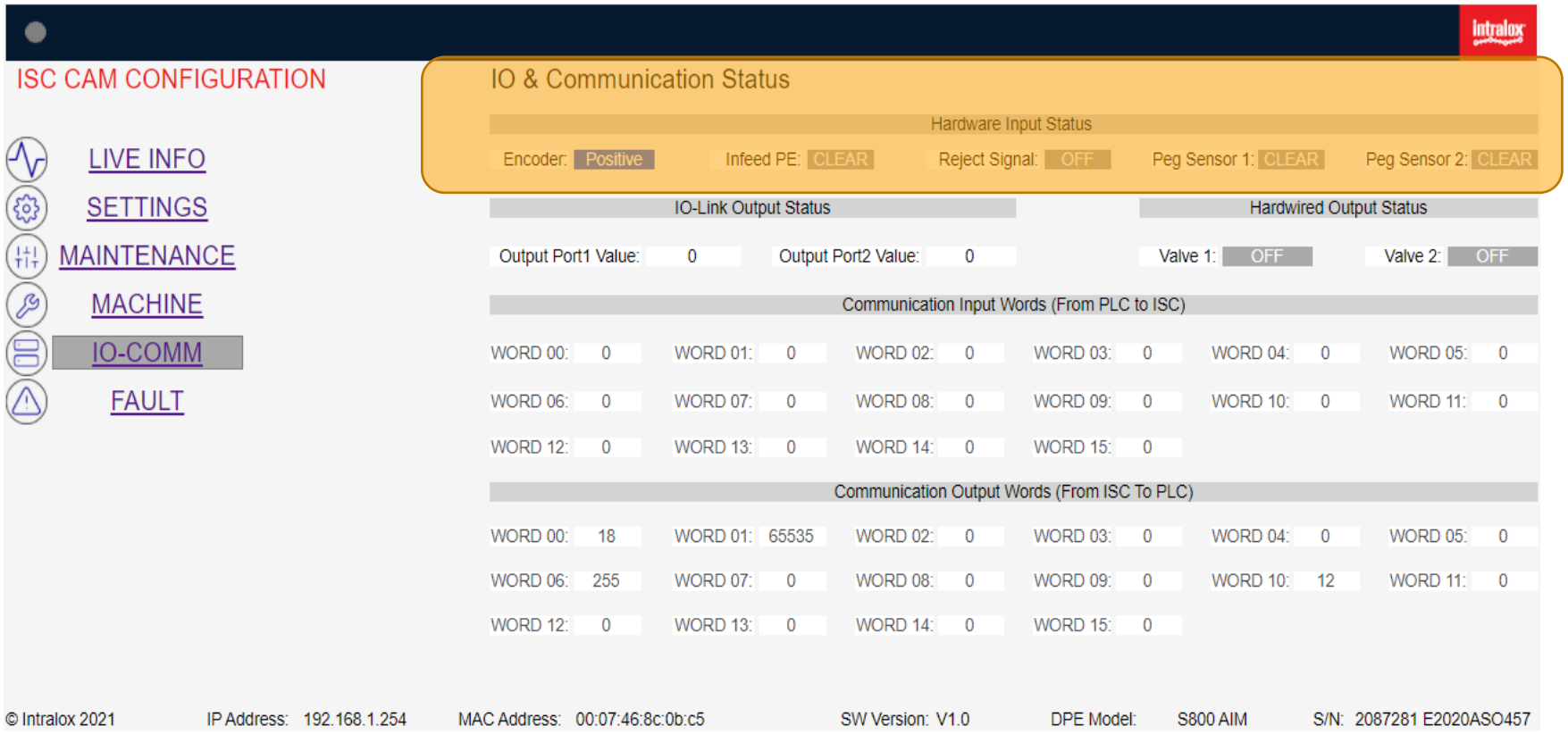
End in Mind

- 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

- ‘read only’

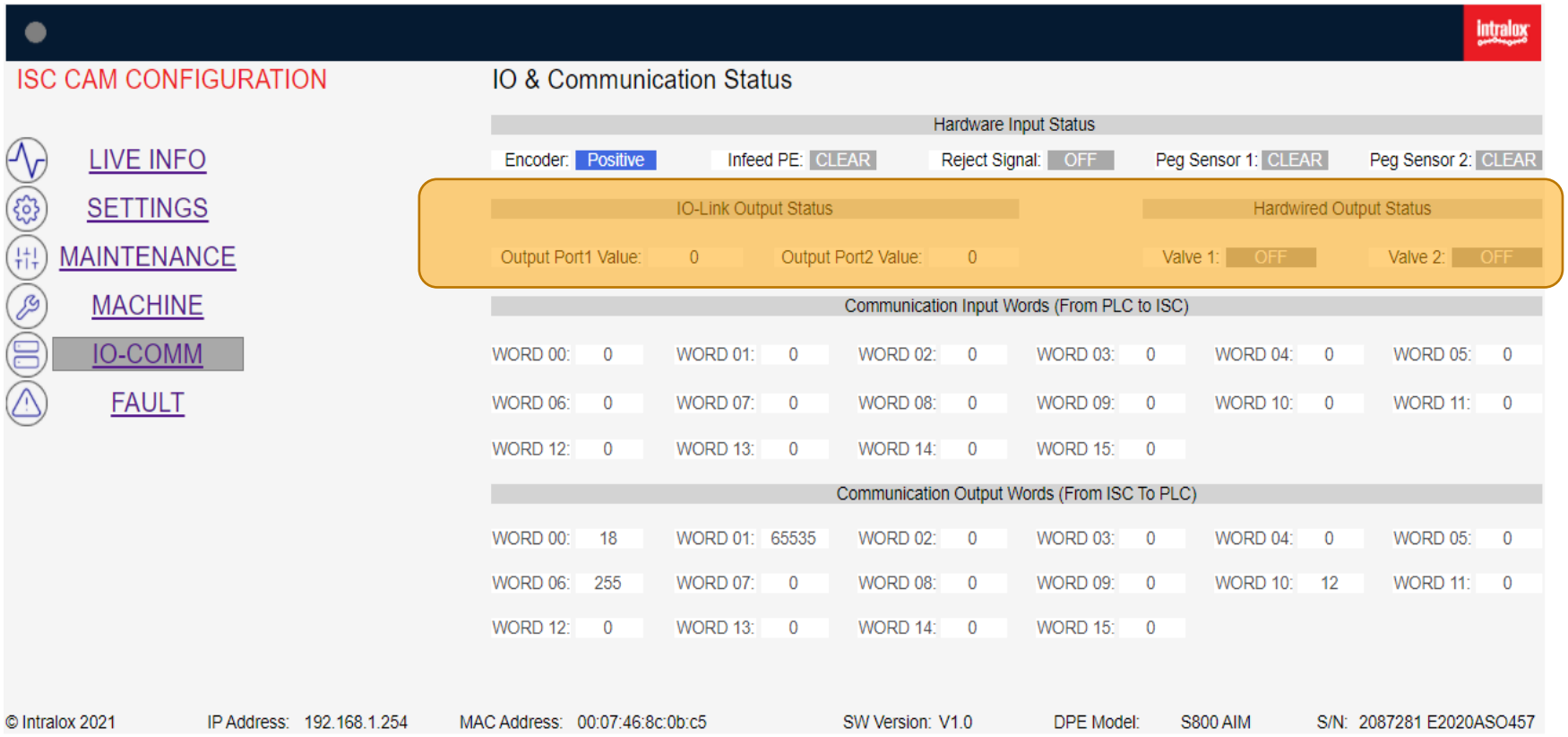
- Intended users
  - Line control engineers

IO-COMM Status



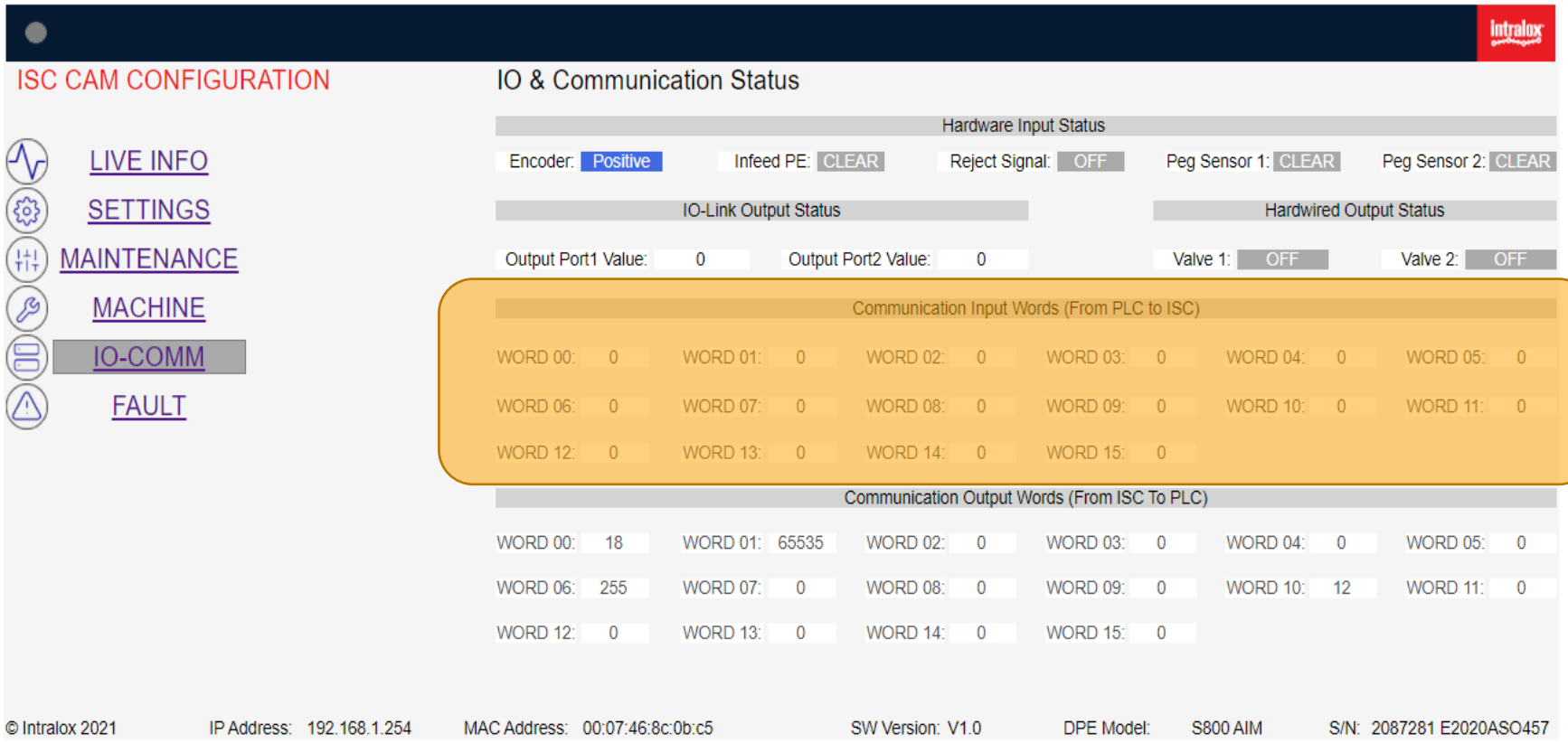
- **Encoder**
  Status of encoder, blinking with each pulse
- **Infeed PE**
  Status of infeed product sensor
- **Reject Signal**
  Status of hardwire reject signal
- **Peg Sensor 1**
  Only applicable for AIM applications. Status of peg sensor of divert 1, blinking with each peg passing the beam the peg sensor (belt has to move)
- **Peg Sensor 2**
  Only applicable for AIM applications. Status of peg sensor of divert 2, blinking with each peg passing the beam the peg sensor (belt has to move)

IO-COMM Status



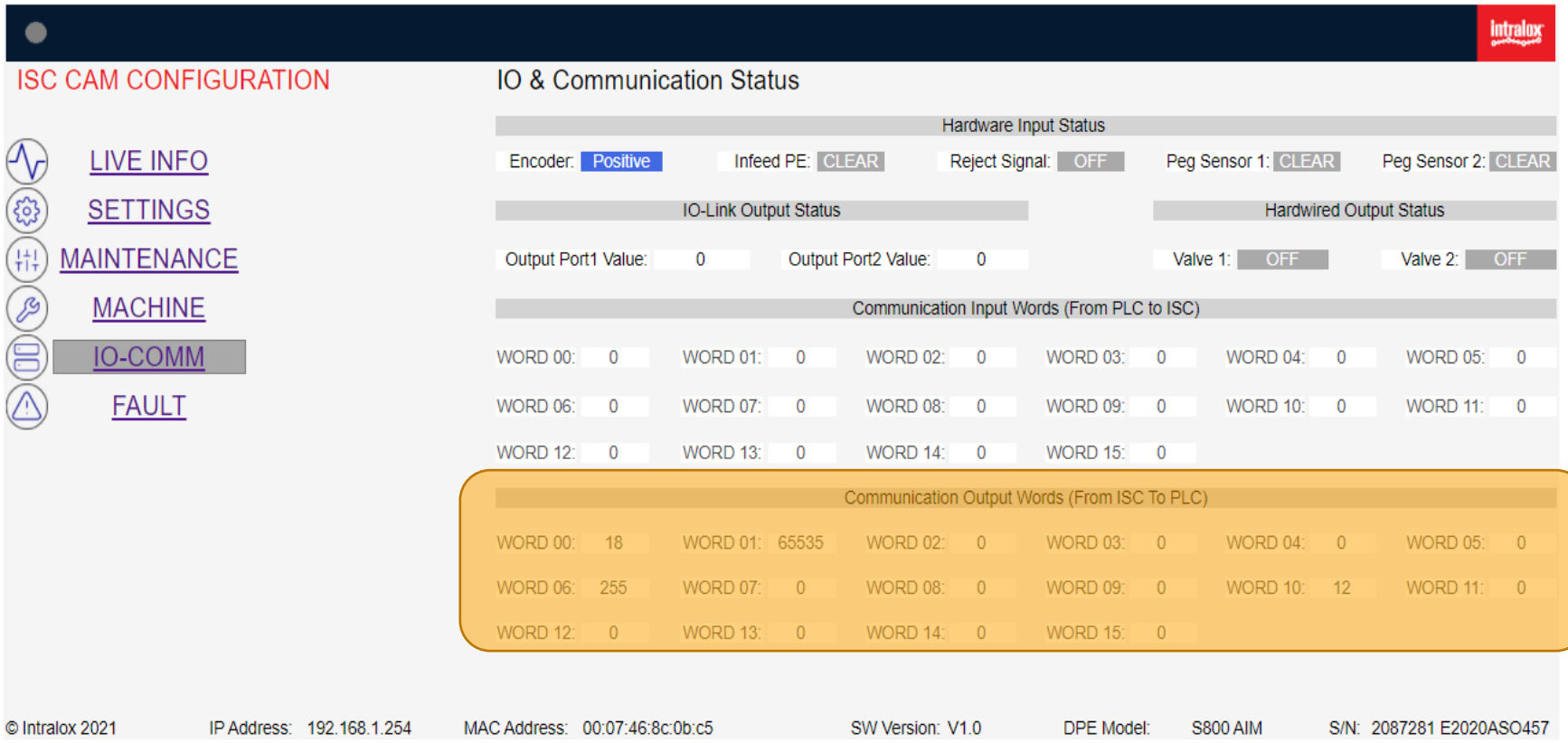
- **IO-Link Output Status**
  - **Out Port 1 valve**
    Only applicable to RnR technology. Status of valve bank.
  - **Out Port 2 valve (optional)**
    Only applicable to RnR technology. Status of valve bank.
- **Hardware Output Status**
  - **Valve 1**
    Only applicable to Popup and AIM technology
    OFF: valve is off
    ON: valve is on.
  - **Valve 2 (optional)**
    Only applicable to Popup and AIM technology
    OFF: valve is off
    ON: valve is on.

IO-COMM Input Words



1. Words sent by the ISC CAM to the Line PLC through the ethernet network
2. See ISC CAM Interlocks file for details

IO-COMM Output Words



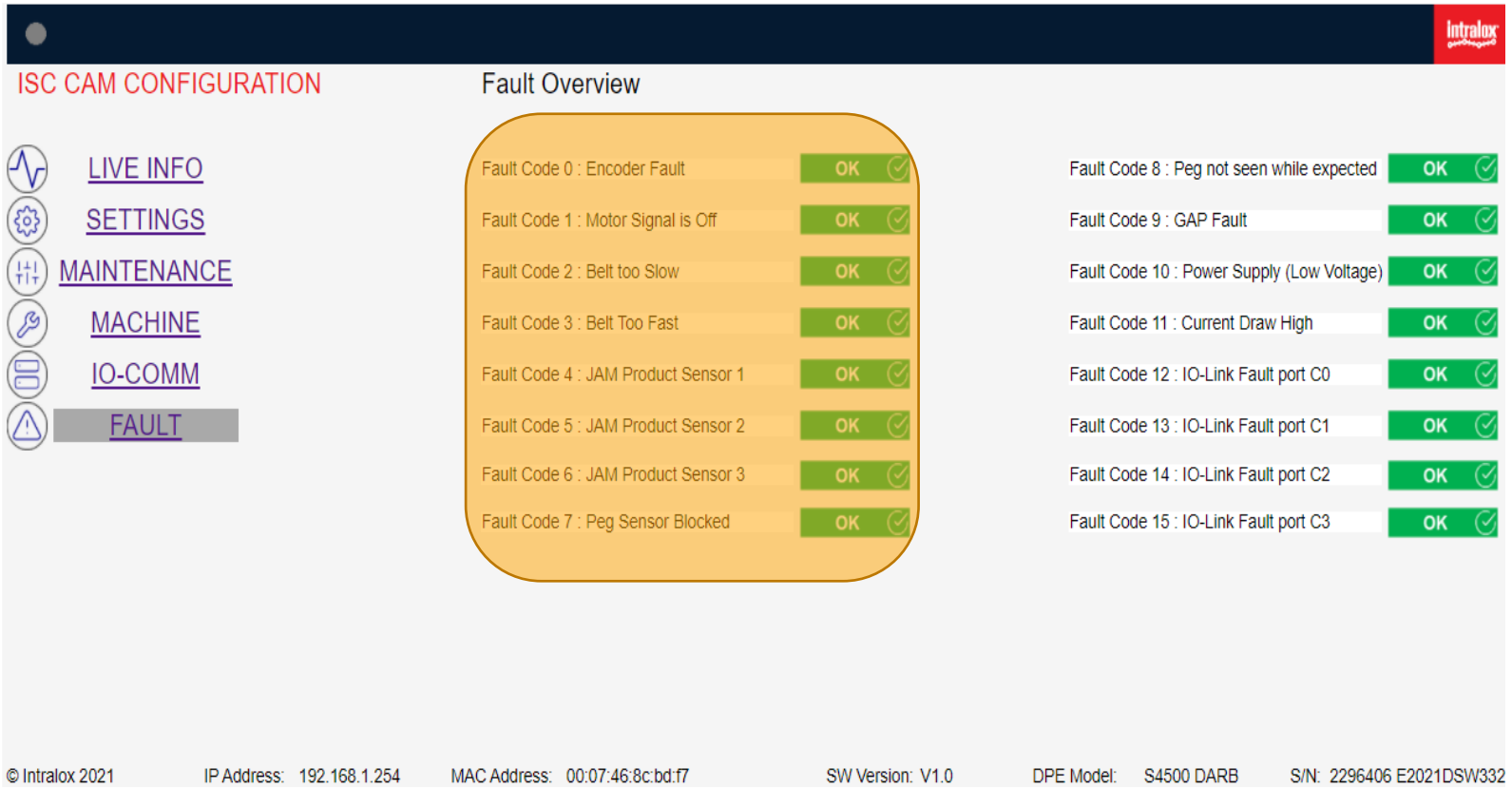
1. Words received by the ISC CAM from the Line PLC through the ethernet network
2. See ISC CAM Interlocks file for details

6. Fault Page

End in Mind

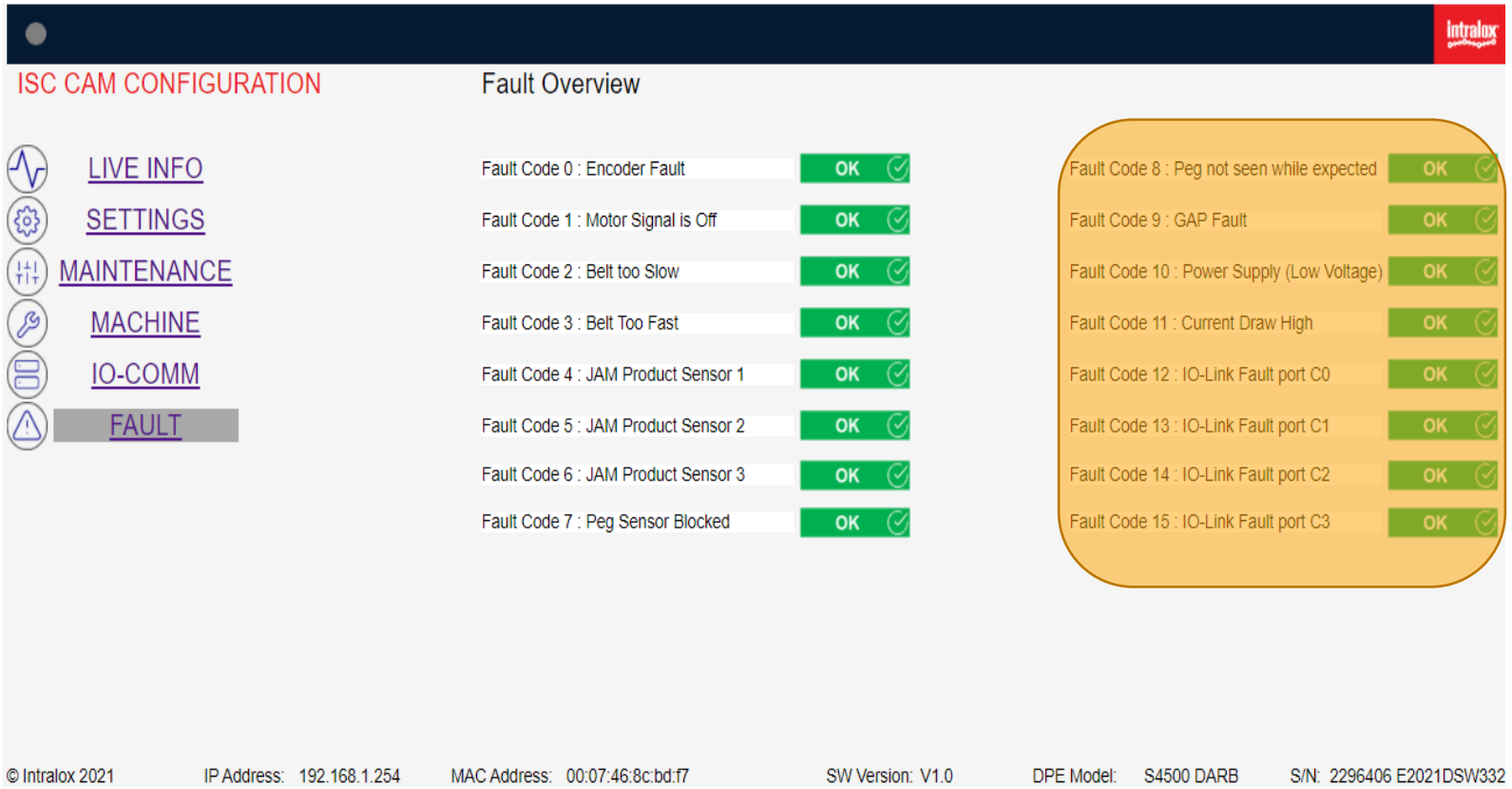
- Display the status of the faults generated by the ISC CAM in human readable interface.
- Refer to the ISC CAM Interlocks Document for details and ISC Troubleshooting document for actions
- ‘Read only’
- Intended users: all users

Fault 0-7



- **Fault Code 0**
  No encoder signal received from encoder
- **Fault Code 1**
  Encoder pulsing but no signal received from Line PLC for motor on.
- **Fault Code 2**
  Belt speed is slower than minimum recommended speed. See Functional Layout for minimum speed.
- **Fault Code 3**
  Belt speed is faster than maximum recommended speed. See Functional Layout for maximum speed
- **Fault Code 4**
  Infeed Product sensor 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 blocked 1 or 2 (if applicable), see ISC troubleshooting guide.

Fault 8-15



- **Fault Code 8**
  - Only applicable to AIM Technology
  - Peg missing in the belt.
- **Fault Code 9**
  - See Functional Layout for min gap value
- **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 RnR Technology
  - Optional. See Functional Layout for configuration of Intralox equipment
- **Fault Code 13**
  - Only applicable to RnR Technology
  - See Functional Layout for configuration of Intralox equipment and ISC troubleshooting guide.
- **Fault Code 14**
  - Only applicable to RnR Technology
  - Optional. See Functional Layout for configuration of Intralox equipment , and ISC troubleshooting guide.
- **Fault Code 15**
  - Only applicable to RnR Technology
  - Optional. See Functional Layout for configuration of Intralox equipment and ISC troubleshooting guide.