TROUBLESHOOTING

ISC CAM

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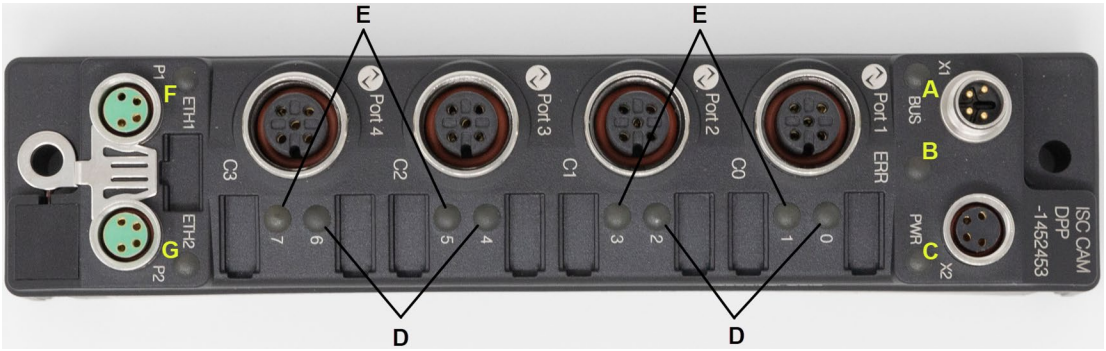
LED DISPLAYS

The Intralox® Smart Carryway (ISC) Carryway Automation Module (CAM) has the following LED indicators supporting troubleshooting:

- Power supply
- Group and bus errors
- Status
- Diagnostics



A LED BUS
B LED ERR
C PWR LED
D LED IOL 0, 2, 4, 6
E LED DXP 1, 3, 5, 7
F LED ETH 1
G LED ETH 2

Figure 1: LED indicators

PWR LED	Meaning
Off	No voltage or undervoltage at V1
Green	Voltage at V1 and V2 ok
Red	No voltage or undervoltage at V2

LED BUS	Meaning
Off	No voltage connected
Green	Active connection to a master
Flashing green 3x in 2s	ISC CAM is active
Red	IP address conflict, Restore mode active, F_Reset active or Modbus connection timeout
Red flashing	Wink command active
Red/green (1 Hz)	Autonegotiation and/or waiting for DHCP- /BootP- address assignment

LED ERR	Meaning
Off	No voltage connected
Green	No diagnostics
Red	Diagnostic message pending

LEDs ETH1 and ETH2	Meaning
Off	No Ethernet connection
Green	Ethernet connection established, 100 Mbps
Green Flashing	Ethernet traffic, 100 Mbps
Yellow	Ethernet connection established, 10 Mbps
Yellow Flashing	Ethernet traffic, 10 Mbps

LED IOL 0, 2, 4, 6 (IO-Link port)	Meaning (Channel in IO-Link mode)
Off	Port inactive, no IO-Link communication, diagnostics deactivated
Green flashing	IO-Link communication, process data valid
Red flashing	IO-Link communication active and module error, invalid process data
Red	IO-Link supply error free, no IO-Link communication and/or module error, process data invalid

LED IOL 0, 2, 4, 6 (IO-Link port)	Meaning (channel in SIO mode (DI))
Off	No input signal
Green	Digital input signal active

LED DXP 1, 3, 5, 7	Meaning (input)	Meaning (output)
Off	Input not active	Output not active
Green	Input active	Output active (max. 2 A)
Red	–	Output active with overload/short circuit

APPLICATION ISSUES

Access the Virtual HMI for detail diagnostics of the ISC CAM.

PRODUCT TRANSFERRING OUT TOO EARLY / TOO LATE

The ISC CAM may not be causing the issue. See the Distinct Piece of Equipment (DPE) User Manual troubleshooting procedures for additional troubleshooting options.

NOTE: Consider how the ISC CAM prioritizes inputs, when executing changes in the ISC CAM. See the ISC CAM Commissioning Guideline, Basic Setup, Prioritization section.

POSSIBLE CAUSE	ACTION
Activation of divert area is too late because of different friction factor between product and belt roller. • Wear belt activation system (belt roller, popup/Rack and Roll, cylinder, etc.)	Adjust Intralox activation position using ISC CAM Virtual HMI by trailing edge activation.
	Adjust Intralox activation position using ISC CAM Virtual HMI by center activation.
	Adjust Intralox activation position using ISC CAM Virtual HMI by applying a divert position offset.
Activation of divert area is too early because of different friction factor between product and belt roller.	Adjust Intralox activation position using ISC CAM Virtual HMI by trailing edge activation.
	Adjust Intralox activation position using ISC CAM Virtual HMI by center activation.
	Adjust Intralox activation position using ISC CAM Virtual HMI by applying a divert position offset.
Activation zones do not complete movement.	1. Ensure air pressure is correct. 2. Ensure the equipment is clean. 3. Using ISC CAM virtual HMI, ensure the sideways motion limit is set properly.

PRODUCT SKEWING

The ISC CAM may not be causing the issue. See the DPE User Manual troubleshooting procedures for additional troubleshooting options.

POSSIBLE CAUSE	ACTION
Products are skewed when transferring onto the Intralox conveyor.	Minimize product skewing at the infeed of the Intralox conveyor.
Improper transfers set up (height, etc.).	Adjust transfers to minimize skewing [see the equipment User Manual].
Different belt speeds of Intralox conveyor and its infeed and outfeed conveyors.	Adjust belt speeds to be identical.
ISC-specific root cause. Defective encoder.	Ensure the divert position settings are correct.

PRODUCT NOT DIVERTED

The ISC CAM may not be causing the issue. See the DPE User Manual troubleshooting procedures for additional troubleshooting options.

POSSIBLE CAUSE	ACTION
Parent device is not sending the “divert command” to the ISC in a timely manner and in the proper format.	Ensure parent device sends the right information in a timely manner.
Gap between products is smaller than the minimum gap specified for this application (Appendix B and ISC Virtual HMI). If the gap between two (2) products is too short, the ISC sends the second product to the same destination as given to the first one.	Increase product gap to meet specification.
No or low air pressure.	Increase air pressure to within acceptable range.
ISC does not receive sensor signals.	Verify encoder, PE status on the virtual HMI of the ISC. If shown as defective: 1. Inspect LEDs on ISC 2. Inspect cable connections 3. Replace components
Defective actuation system (valve, cylinder).	Replace faulty components.

CONVEYOR BELT IS NOT MOVING

The ISC CAM may not be causing the issue. See the DPE User Manual troubleshooting procedures for additional troubleshooting options.

POSSIBLE CAUSE	ACTION
Products are jammed on the conveyor or the belt is overloaded.	1. Clear any product jams. 2. Inspect product load to ensure it is not excessive for the equipment. Reduce the load as needed.
The sprockets do not engage the belt.	1. Ensure the sprockets are properly positioned on the belt. 2. Inspect the sprockets for excessive wear. Repair or replace parts as needed. 3. Measure the sprocket bore for excessive wear. 4. Inspect the sprocket pockets in the belt for excessive wear. Repair or replace parts as needed. 5. Inspect the belt for excessive elongation. 6. Inspect the belt to ensure proper back tension is applied. Adjust the belt as needed. 7. Inspect the catenary sag in the returnway and adjust return rollers if needed.
The drive motor is not operating properly.	Ensure drive motor power is connected and the drive motor is wired properly.
	Ensure the Variable-Frequency Drive (VFD) is operating properly (if applicable).

The shafts are damaged or not adjusted properly.	Ensure the drive motor is mounted to the drive shaft securely.
	Inspect the shaft bearings for damage or excessive wear.
Downstream conveyor or chutes are full.	Ensure the downstream conveyor and chutes are cleared before starting the equipment.

PRODUCTS DO NOT REACH THE ASSIGNED OUTFEED

The ISC CAM may not be causing the issue. See the DPE User Manual troubleshooting procedures for additional troubleshooting options.

POSSIBLE CAUSE	ACTION
Debris is blocking the belt or belt rollers from moving.	Clean the belt to remove any debris blocking the belt or belt rollers.
The product bottom surface is not suitable for the equipment.	1. Inspect the product bottom surface for moisture, oils, debris, damage, or irregularities. 2. Remove any debris or damaged products.
The belt is not installed properly.	1. Ensure the belt is properly aligned down the length of the conveyor. 2. Ensure the belt properly engages the sprockets. 3. Inspect the catenary sag in the returnway and adjust return rollers if needed.
Debris is blocking the Rack and Roll rollers from rotating.	1. Disable power to the equipment. 2. Open the belt. 3. Inspect the Rack and Roll rollers to ensure they rotate freely. 4. Remove any debris blocking the movement of the Rack and Roll rollers. 5. Clean the Rack and Roll rollers as needed, to remove any debris. 6. Close the belt and restart the equipment.
The belt or belt rollers are damaged.	1. Inspect the belt, belt rollers, and rods to ensure they are undamaged and operating properly. 2. Repair or replace parts as needed. 3. Inspect the belt length to ensure the damage is not caused by improper catenary sag. 4. Measure the sprocket bore for excessive wear.
There is excessive belt roller wear.	1. Inspect belt rollers for excessive wear. 2. Replace belt sections as needed.
There is excessive Rack and Roll roller wear.	1. Disable power to the equipment. 2. Open the belt. 3. Inspect the Rack and Roll rollers for excessive wear. 4. Replace any damaged Rack and Roll rollers. 5. Close the belt and restart the equipment.
A Rack and Roll roller is blocked.	1. Ensure Rack and Roll rollers move properly. 2. Ensure Rack and Roll system is functioning properly. 3. Ensure the actuation system is connected properly and power is supplied to the Rack and Roll actuators.

	4. Ensure proper air pressure is supplied to the pneumatics (as needed) [See pneumatic schematics]. Contact Intralox Customer Service for additional assistance. • Ensure Rack and Roll electric actuators are properly connected, if applicable.
The product gapping is not adjusted properly.	Inspect gap between products entering the system and adjust as needed [See functional layout]. Contact Intralox Customer Service if uncertain about the proper gap.
A sensor is blocked or is not functioning properly.	1. Remove any debris blocking the sensors. 2. Ensure the sensors are aligned properly to see products. 3. Ensure the sensors are calibrated properly. 4. Repair or replace sensors as needed.
Pneumatics are not functioning properly.	1. Ensure proper air pressure is supplied to the pneumatics. 2. Ensure clean, dry air is supplied to the pneumatics. 3. Ensure the solenoid valves are functioning properly. 4. Ensure the pneumatic cylinders move properly.
The encoder is not operating properly.	1. Ensure the encoder is properly connected. 2. Ensure the encoder Pulses per Revolution (PPR) is set to 64. 3. Repair or replace the encoder.
The parent PLC is not functioning properly.	1. Ensure the parent PLC is not faulted. 2. Reset the parent PLC and restart the equipment. 3. Connect to the parent PLC and ensure the program is executing properly.
Sensors are not secured properly or are not positioned directly facing each other.	1. Ensure sensor brackets are tight so sensors cannot move during operation. 2. Ensure both photoelectric sensors of a set are directly facing each other.
Destination conveyor or chute is full.	Ensure the destination conveyor or chute is clear.
ISC CAM is tracking more than 15 products.	The ISC CAM can handle up to 15 products on a single piece of equipment. If this limit is met the ISC CAM will start diverting irregularly. Increase gap or decrease throughput to maintain proper functioning of the equipment.

PRODUCTS DO NOT TRANSFER PROPERLY

The ISC CAM may not be causing the issue. See the DPE User Manual troubleshooting procedures for additional troubleshooting options.

POSSIBLE CAUSE	ACTION
The transfer height is too high or too low.	Adjust the transfer height.
The conveyors are not set to the proper speed.	Adjust the conveyor speed.
Debris is blocking the operation of the transfer.	Remove any debris blocking the operation of the transfer.
The product is too small for the transfer to convey.	Contact Intralox Customer Service for assistance.
The product bottom surface is not suitable for the equipment.	1. Inspect the product bottom surface for moisture, oils, debris, damage, or irregularities. 2. Remove any debris or damaged products.
The powered roller transfer is not set to the proper speed.	Adjust the powered roller speed as needed.
A transfer roller is not working.	1. Inspect for damaged rollers and replace with new rollers. 2. Inspect for damaged bearings and replace with new bearings.
Products are not oriented properly when entering the transfer.	Ensure products are oriented properly when entering the transfer.

UNUSUAL NOISE OR VIBRATION COMING FROM THE BELT

The ISC CAM may not be causing the issue. See the DPE User Manual troubleshooting procedures for additional troubleshooting options.

POSSIBLE CAUSE	ACTION
The catenary sag is not adjusted properly.	1. Measure belt pitch and adjust as needed. 2. Inspect the catenary sag in the returnway and adjust as needed [See the equipment User Manual for more information and adjustment procedures].
Debris in the belt is causing excessive noise.	Clean the belt to remove any debris.
Peg is jumping the activation mechanism. (AIM only)	Clean the activation mechanism, check the smooth operation of the mechanism.
Peg is jumping the activation mechanism when activating. (AIM only)	Change the “Activation Delay Override” value in the vHMI. Changes by no more than 5ms per step are recommended.
Peg is jumping the activation mechanism when de-activating. (AIM only)	Change the “De-activation Delay Override” value in the vHMI. Changes by no more than 5ms per step are recommended.

UNUSUAL NOISE OR VIBRATION COMING FROM THE SHAFT SUPPORT BEARINGS

The ISC CAM may not be causing the issue. See the DPE User Manual troubleshooting procedures for additional troubleshooting options.

POSSIBLE CAUSE	ACTION
The shaft support bearings are damaged.	1. Inspect the bearings to ensure they are not damaged. 2. Ensure the bearings are lubricated properly. 3. Repair or replace parts as needed.
The sprockets shift under the weight of the belt as the shaft rotates, causing a clicking noise.	1. Determine if the noise occurs four (4) times per shaft revolution. 2. If needed, record the setting on the VFD, then lower the speed of the VFD to hear the noise. 3. If the noise occurs four (4) times per shaft revolution, it is the normal noise of the sprockets shifting. 4. Ensure the sprocket is installed properly. Verify all fasteners are tightened on the split sprockets. Tighten the split sprocket halves to each other, not the shaft. 5. Contact Intralox Customer Service for additional assistance.

FAULTS TO PARENT DEVICE

PARENT DEVICE INDICATES MOTOR RUNNING, ENCODER DETECTS NO MOTION

Parent device indicates the drive motor is running, but the encoder does not detect motion.

POSSIBLE CAUSE	ACTION
Encoder broken.	Replace encoder.
Encoder cable disconnected.	Connect encoder cable.

PARENT DEVICE INDICATES MOTOR IS OFF, ENCODER DETECTS MOTION

Parent device indicates the drive motor is off, but the encoder detects belt motion.

POSSIBLE CAUSE	ACTION
Wrong timing in setting up communication parent device – ISC.	Ensure the signal is sent in a timely manner.

BELT IS DETECTED TO BE MOVING TOO SLOW AND NOT STOPPED

POSSIBLE CAUSE	ACTION
Belt moving slower than allowed MIN belt speed, risk of product being stranded at transfers	Increase belt speed to within acceptable range.

BELT IS DETECTED TO BE MOVING TOO FAST

POSSIBLE CAUSE	ACTION
Belt moving faster than allowed MAX belt speed, risk of mechanical damage to machinery or of product diverting improperly.	Decrease belt speed to within acceptable range.

STATUS OF PHOTOEYE PRODUCT SENSOR

POSSIBLE CAUSE	ACTION
Sensor blocked.	Remove product or debris or other blockage.
	Ensure sensor is not damaged.
Encoder malfunction.	Replace encoder.
	Connect encoder cable.

PEG SENSOR BLOCKED, BELT MOVING

Peg sensor blocked continuously with belt moving. Only applicable for AIM technology

POSSIBLE CAUSE	ACTION
Debris blocks the peg sensor.	Open belt and do a visual inspection of the peg sensor, cylinder, and the puck and the cavity of the carryway where the puck is mounted.
AIM activation block is obstructed.	Open belt and do a visual inspection of the peg sensor, cylinder, and the puck and the cavity of the carryway where the puck is mounted.

PEG NOT SEEN WHEN EXPECTED

Only applicable for AIM technology

POSSIBLE CAUSE	ACTION
Broken peg.	Find broken or damaged belt module and replace with new module.

GAP FOR NEXT PRODUCT

POSSIBLE CAUSE	ACTION
Gap too short.	Increase product gap to meet specification.

TOO HIGH OR TOO LOW VOLTAGE FROM POWER SUPPLY

POSSIBLE CAUSE	ACTION
Power supply is faulty.	Adjust or replace power supply.

TOO MUCH OR TOO LITTLE CURRENT DRAW

POSSIBLE CAUSE	ACTION
Electrical short.	Replace broken cable or sensor.
Cable disconnected.	Connect cable, ensure cable is not damaged.

I/O LINK FAULT PORT

POSSIBLE CAUSE	ACTION
Broken I/O link device.	Replace I/O link device.

Loose or damaged communication cable.	Reconnect or replace I/O link cable.

LED FAULTS

POWER FAULT – RED LED FOR POWER

POSSIBLE CAUSE	ACTION
Connector loose.	Retorque connector per ISC CAM Commissioning Guideline, Electrical Connections.
Facility power disrupted (no voltage).	Contact facility management to correct power disruption.
Damaged power cable.	Replace power cable.
Facility power incorrect (voltage too high or too low).	Contact facility management to obtain correct 24 VDC power.

POWER FAULT – RED LED FOR BUS

POSSIBLE CAUSE	ACTION
IP address conflict.	Verify and set proper IP address. See Commissioning Guideline for details.
Restore mode active.	Power cycle the ISC.
Modbus connection timeout.	Power cycle the ISC. Verify the network settings and hardware.

POWER FAULT – RED/GREEN (1 HZ) LED FOR BUS

POSSIBLE CAUSE	ACTION
Autonegotiation.	No action required.
Waiting for DHCP- /BootP- address assignment.	Ensure network sends address to ISC.

POWER FAULT – RED LED FOR ERR

POSSIBLE CAUSE	ACTION
Diagnostic message pending.	No action required.

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