



EQUIPMENT AUXILLARY SENSORS

OVERVIEW

The items discussed in this document will cover auxiliary sensors which may be include with Intralox equipment. Such sensors are air pressure, Power Tight Transfer (PTT) belt elongation sensors, and jam sensors.

SCOPE

The information provided would give guidance on how to integrate the additional components into a system. It will include details for wiring to the line controller and software of each type of auxiliary sensors which is not in the scope of Intralox Smart Carryway (ISC) Carryway Automation Module (CAM).

AUXILIARY SENSORS

ELONGATION SENSOR FOR POWER TIGHT TRANSFERS (PTT)

The PTT elongation sensor is a thru-beam photoelectric sensor style with emitter and receiver. This pair of sensors is dedicated to detecting excessive belt stretch for Power Tigh Transfer (PTT) provided with some of Intralox equipment. Typically, for conveying applications handling smaller products such as 4-pack beverages.

MANUFACTURER: **SICK**

MANUFACTURER PART NUMBER: **WSE9L-3P2437 – 1058181**

DESCRIPTION: **THRU-BEAM PHOTOELECTRIC SENSORS**

ELECTRICAL DIAGRAM: (1) EMITTER (2) RECEIVER

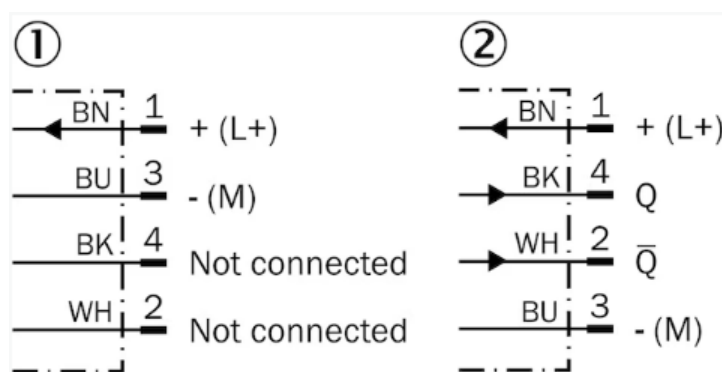


Figure 1: Wiring diagram for emitter (1) and receiver (2)



Figure 2: Sick thru-beam sensors image

PROGRAMMING LOGIC: The sensors are set in a light operate mode and the input scanned for a FALSE condition of the sensor. This is done to create a fail-safe mode in case there may be a damaged cable, disconnection, defective sensor, etc. Once the PLC recognizes a false state of the sensor a maintenance warning shall be triggered to indicate a time to check the PTT belt for elongation. If the status of the input does not change for 24 hours (default) then a fault could be set to indicate the belt needs immediate attention. It is not recommended to continuously operate the belts for long period of time without addressing the belt tension issue. That is the reason for setting a fault after 24 hours to indicate an immediate response before a serious issue causes extended downtime.

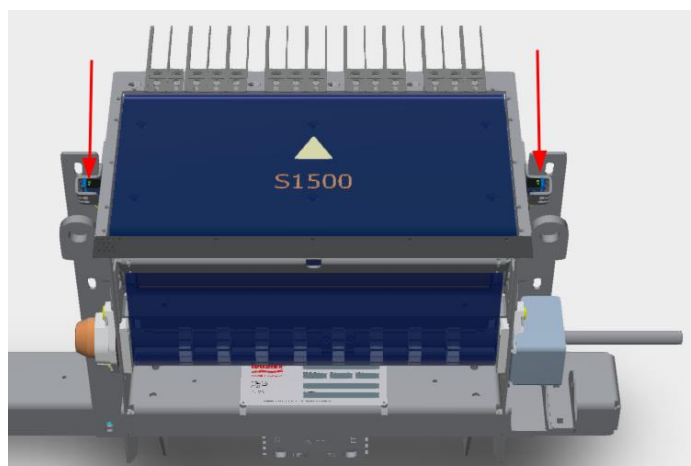


Figure 3: PTT sensor locations

EQUIPMENT JAM SENSOR

A jam sensor at the discharge of Intralox equipment, primarily S7000 or S7050 switch technologies. It is intended to stop a backup/jam at the discharge of the equipment. Possibly, due to downstream equipment or a misalignment to a downstream lane divider at the discharge of a system. There are two different manufacturers used for the photoelectric sensors on Intralox equipment, Banner and Sick.

MANUFACTURER: **BANNER**

MANUFACTURER PART NUMBER: **QS18VP6LPQ8**

DESCRIPTION: **POLARIZED RETROREFLECTIVE PHOTOELECTRIC SENSOR**

MANUFACTURER: **SICK**

MANUFACTURER PART NUMBER: **HL18-P4A3BA**

DESCRIPTION: **PHOTOELECTRIC RETRO-REFLECTIVE SENSOR**

Connection type	Male connector M12, 4-pin
Pinouts	
BN 1	+ (L+)
WH 2	Q ₂
BU 3	- (M)
BK 4	Q ₁

Figure 4: Sensor M12 connection key pinout

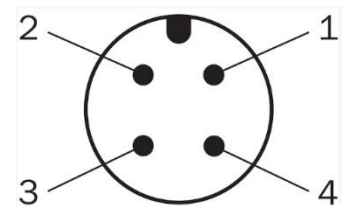


Figure 5: Electrical pin connections

PROGRAMMING LOGIC: The sensors are set in a light operate mode and the input is scanning for a FALSE condition of the sensor. This is done to create a fail-safe mode in case there may be a damage cable, disconnection, defective sensor, etc. Anytime the sensor triggers a false state of the sensor an encoder counter begins. While the sensor is blocked the counter continues to grow each time there is an encoder pulse. Once the counter is ≥ 80 pulses (default) a fault is triggered indicating a jam on the equipment. The 80 pulses are a good starting point, some applications may require this value to be higher or lower. The result of changing the 80-pulse threshold is how long until the equipment faults to a shut down.

Calculation example:

$$[\text{Distance (mm)} = (\text{Belt Nominal Pitch} * \text{Sprocket Teeth Count} / (\text{Encoder resolution} * 2)) * \text{pulses}]$$

An alternative way to measure a jam is using a timer. The downside to using a timer is it does not consider whether the belt motor is operating and does not adjust automatically to the belt speed.

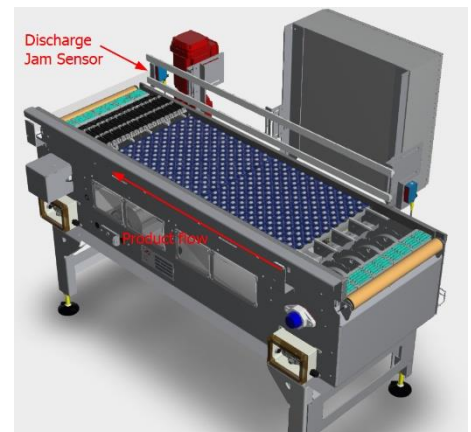


Figure 6: Intralox switch with jam sensor

AIR PRESSURE SENSOR

An air pressure sensor may be included with the equipment. Out of the factory it is typical for the sensor to be set for an operating range of 30-50 psi (2.07-3.45 Bar). The output of the sensor would be True (24VDC) when operating pressure is within the set rang and False (0VDC) when not in range. The sensor is part of a large air pressure assembly – regulator, filter, sensor, etc.

MANUFACTURER: FESTO

MANUFACTURER PART NUMBER: **SDE1-D10-G2-MS-L-P1-M8**

DESCRIPTION: AIR PRESSURE SENSOR


Pin / wire colour	Allocation
	3-pin M8
	
1 / brown (BN)	Operating voltage +24 V
2 / -	-
3 / blue (BU)	0V
4 / black (BK)	Switching output OutA

Figure 7: Air pressure sensor wiring pinout diagram



Figure 8: Festo air pressure sensor SDE1-D10-G2-MS-L-P1-M8

PROGRAMMING LOGIC: The sensor is typically set for an operating range of 30-50 PSI (2.07-3.45 Bar) out of the factory. If the sensor reading is within the operating range the output of the sensor would be 24VDC and out of range results in 0VDC. If the sensor goes out of range, then it is standard to produce a fault. A low or high pressure setpoint can have an impact on the performance of the pneumatics used for Intralox equipment.

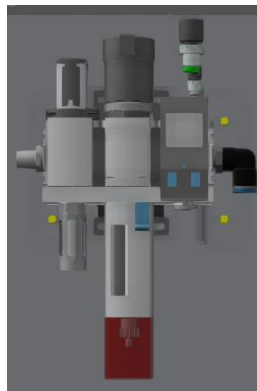


Figure 9: Air pressure assembly including sensor