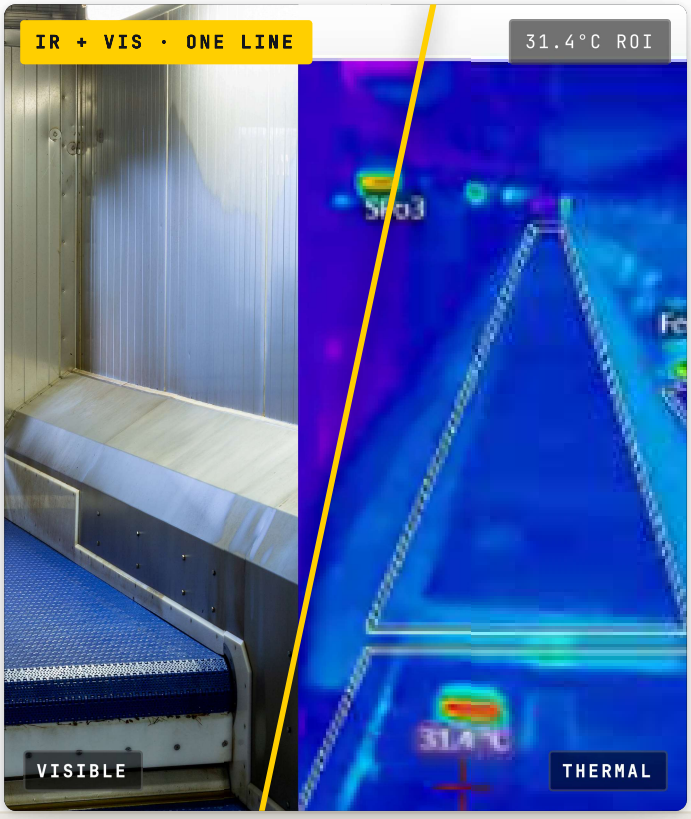
MSAI CONNECT • MATERIAL HANDLING O&M

Continuous IR for Conveyance: Catching the Slow Belt Failures Before the Line Does.



THE CUSTOMER

A reliability engineering lead at a global online retailer, running high-throughput sortation and induct lines across distribution facilities - where a single conveyor is often the only path to the main sorter, and a stoppage stands down a whole shift.

20x
Return on the continuous-monitoring investment, anchored by the high speed gapping beds

30%
Less asset downtime through early detection of belt tension and tracking faults

11.4x
Throughput gain on the gapping beds once belt tension was optimized

01 The blind spot between inspections

Visibility came from two places: monthly handheld thermal sweeps, and the asset failing loudly enough to notice. Both tell you about a problem the same way - after it has already cost something.

A finger belt delaminating at a weld. A belt tracking over and grinding against a sideguard. An over-tensioned belt running hot enough to fail in hours. On a single-point-of-failure conveyor feeding the main sorter, these aren't cosmetic - they take the line, and the shift, down with them.

The failures that matter most don't happen on inspection day. They develop in the weeks between sweeps, in the gaps the handheld camera never sees.

- Handheld thermal - one snapshot a month, nothing in between
- Run-to-failure - the fault announces itself by stopping the line
- The gap - weeks of silent, accelerating belt degradation

FROM THE RELIABILITY LEAD • ON HEAT AS AN EARLY SIGNAL

"On a high-speed belt the failure mode moves in hours. Heat is the first thing that changes - for years I had no way to watch it between inspections."

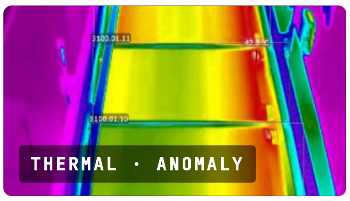
RELIABILITY ENGINEERING LEAD, GLOBAL ENGINEERING PROGRAMS

02 Continuous thermal monitoring, above the systems already in place

MSAI Connect provides fixed-mount IR on the belts that matter - watching 24/7, not waiting for inspection day. Thermal regions of interest sit on each critical belt, the induct bed, the sideguards and the drive components, surfacing the one signal those assets can't hide: the heat of a fault developing.

It doesn't replace the handheld camera or the scheduled walk. It's the layer that's awake in between - the last line of detection before imminent failure, on assets where the failure mode deteriorates in hours to days, not months.

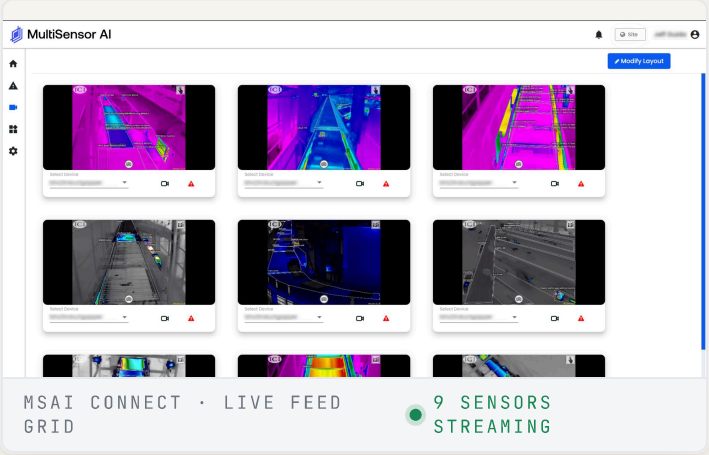




Continuous IR for Conveyance — what it catches, and how the team works because of it. SECTION II

03 What it catches: the slow, dangerous failures

The anchor case is the High Speed Gapping Beds - a single point of failure with downstream disruption. Continuous IR caught over-tensioned belts running hot while the fault was still a maintenance ticket. The RME team optimized tension before failure, cutting downtime 30%, lifting throughput 11.4x, and saving 40% on maintenance cost - a roughly 20x return on the deployment.



MSAI CONNECT · LIVE FEED GRID — 9 SENSORS STREAMING

> *"A belt starting to heat shows up as a thermal signal well before it's tracked far enough, or torn far enough, to take the line down."*

CAUGHT BETWEEN SWEEPS — SAME MONITORING

Finger-belt delamination — $12K
A delaminated weld snagged the conveyor and ran hot. Caught early; the belt was cut out on a redundancy.
2 HRS AVOIDED

Belt wear from a jam — $24K
Two packages lodged in the guard rubbed the belt. Hotspot flagged before failure on a sorter-feed belt.
+ $6.5K BELT

Misalignment / sideguard friction — $18K
Belt tracked over and ground the sideguard. Corrected at the next scheduled downtime.
+ $6.5K BELT

Tray-router discharge bearing — $18K
A failed tracking-roller bearing pushed the belt off-track. Caught immediately - 1 hr downtime, not 4.
+ $6.5K BELT

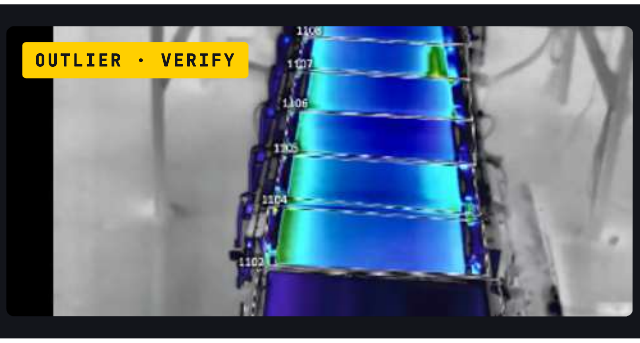
Induct & singulator belts — -40%
ROI-tracked belts surfaced over-tension and tracking deviations early, extending belt life.
MAINT. COST

04 Alerts the team actually acts on

COMPARATIVE, NOT GUESSWORK

It surfaces the outlier. A person makes the call.

On the singulator, one belt consistently ran hotter than its neighbors. Comparative analysis flagged the outlier; the RME team investigated and found an over-tensioned belt as the root cause. MSAI Connect points to the asset that actually needs attention - it doesn't guess at the fix.



05 The change: from investigation to repair

The clearest result isn't a number on a dashboard - it's the change in how the team works. Service calls used to start as investigation. Now crews arrive already knowing which belt they're fixing.

BEFORE · INVESTIGATION

Walk the line, hope to spot it.

- Belt faults ran silent until a tech happened to be standing there, or until the asset failed outright.
- Monthly handheld sweeps left weeks of blind time in between.
- A single-point belt could go from warm to torn in hours - faster than the inspection cycle could catch.

→

AFTER · REPAIR

A tech is dispatched to a coordinate.

- Rising heat surfaces as an alert while the fault is still a maintenance ticket, not a breakdown.
- Crews repair the specific belt during scheduled downtime - fixes, not investigations.
- A continuous, documented thermal record of every critical belt is always on hand.

THE TAKEAWAY • HOPING VS. KNOWING

The monitoring finally changes what the team actually does.

Talk to MSAI →