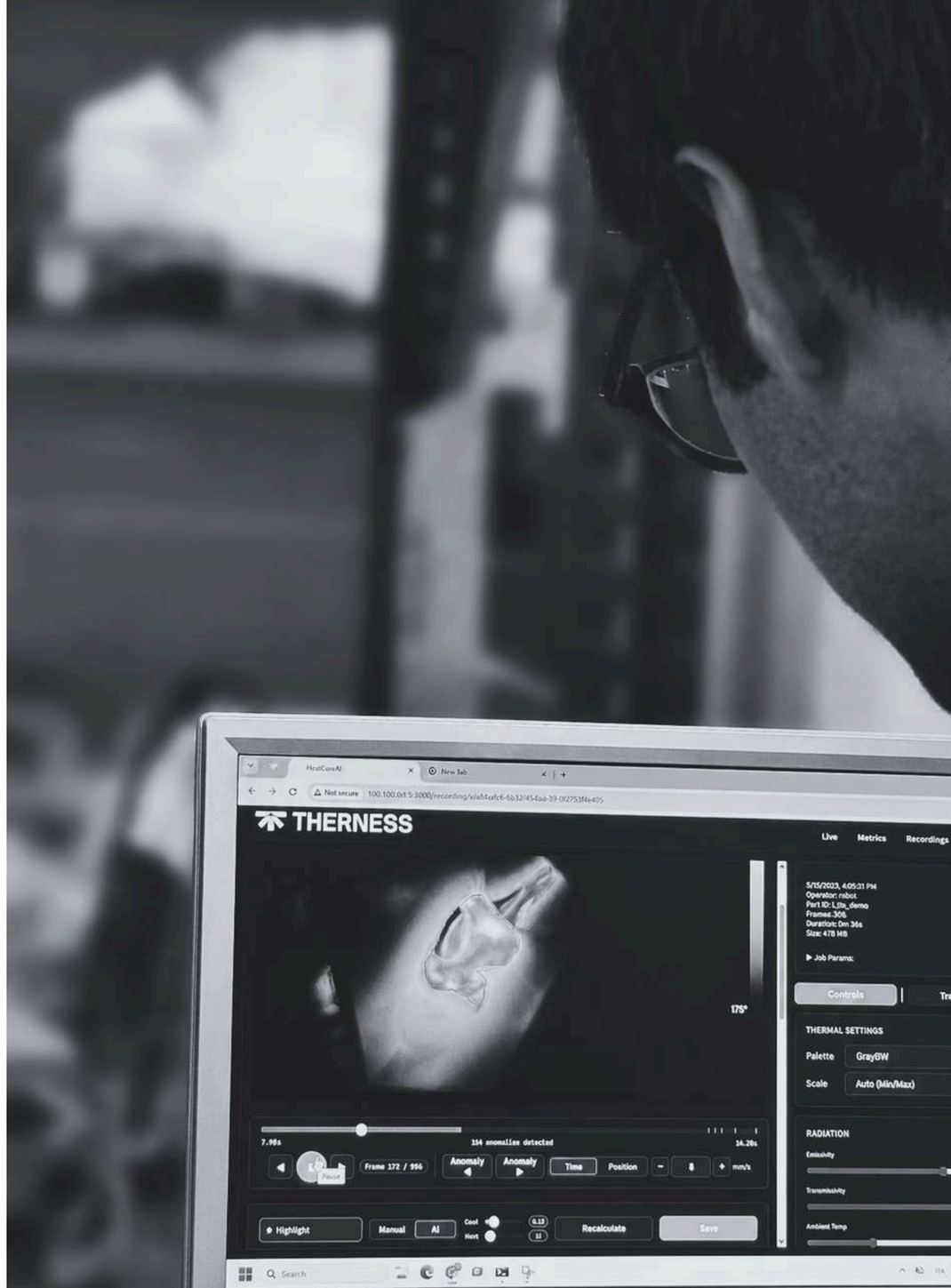
Therness

Non-destructive weld monitoring for manufacturing production lines

100% Monitoring, 0% Guesswork



Spin off del Politecnico di Torino

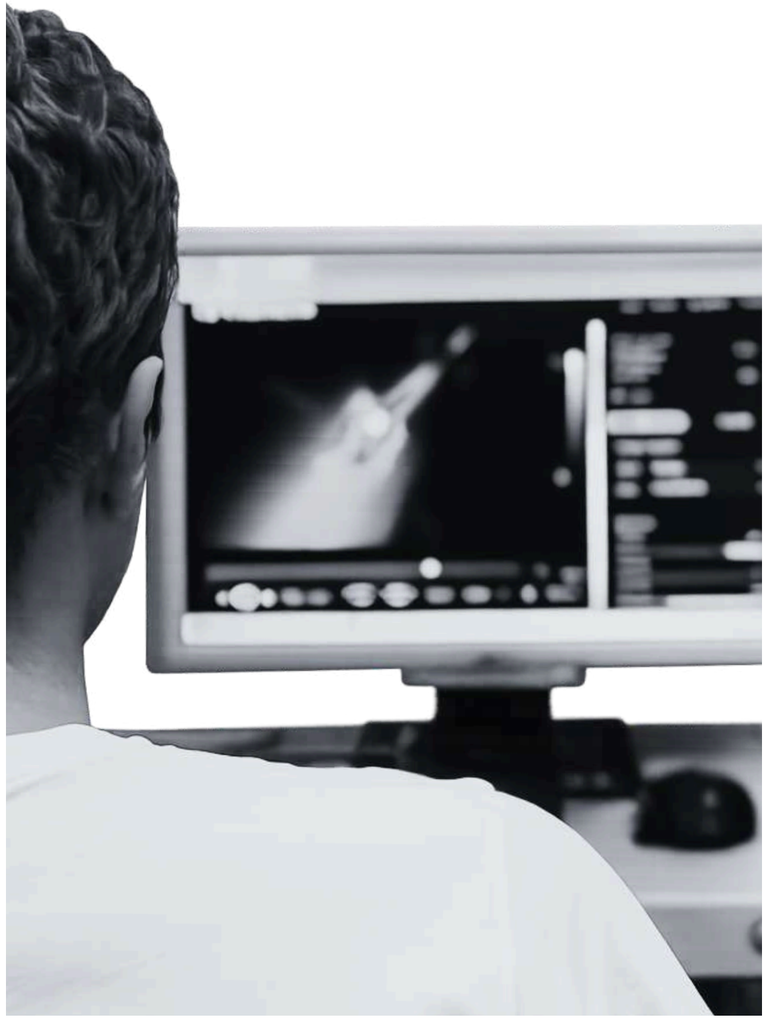
PROBLEM identification ↗

Every defective weld is a “ticking time bomb”.

In automotive, poor-quality defects can cost 10/40% of annual sales[1].

- ✓ **5 % — only inspected**
- ✓ **2–3× — rework cost**
- ✓ **0 % real-time QC — all checks are after the fact**
- ✓ **Manual & expensive QCs**

1: True Cost Of Quality In The Automotive Industry | Intertek SAI Global Australia



TECHNOLOGY

Thermal imaging + AI-driven vision analysis

Integrated directly into your production lines, it detects defects **instantly**, ensures digital traceability and eliminates destructive testing.

Key Benefits:

- 100% **real-time** weld monitoring and analysis;
- Automatic instant defect detection and classification;
- **Seamless** robotic integration;
- Complete digital quality documentation.

TECHNOLOGY

Therness technology seamlessly **adapts to any welding setup**, from traditional processes to advanced manufacturing **in every environment.**

Supported Materials:

- Carbon steel
- Stainless steel
- Aluminum
- Nickel-based alloys
- Titanium alloys
- Plastic materials

Supported Methodologies

- MIG / MAG Welding
- TIG Welding
- Submerged Arc Welding
- Laser Welding
- Wire Arc Additive Manufacturing
- Cladding Applications

VALUE *PROPOSITION*

1
Cost Reduction & Sustainability

Cut QC costs up to 70% while reducing waste, energy use, and boosting ESG performance

2
Process Optimization & Efficiency

Use real-time thermal data to optimize QC, automate processes, and integrate easily with minimal downtime

3
Market Advantage & Business Value

Certified quality boosts reputation, supports premium pricing, and builds lasting customer trust

4
Risk Mitigation & Compliance

Achieve 100% real-time weld inspection with instant alerts and full traceability to prevent recalls and claims.

Our Product Portfolio

1. Therness **HeatCore**
2. Therness **HeatCore AI - powered**
3. Therness **HeatScan**

HeatCore

Integrated Thermal Monitoring System

Components:

- **HeatCam C** – *thermographic camera LWIR;*
- **CU Weld Server** — *industrial fanless computing unit for local data processing and system management;*
- **HeatCore Software** *(perpetual licence).*

HeatCore Ai - powered

The advanced solution for welding environments where standard monitoring is not enough and predictive classification becomes a **competitive advantage**.

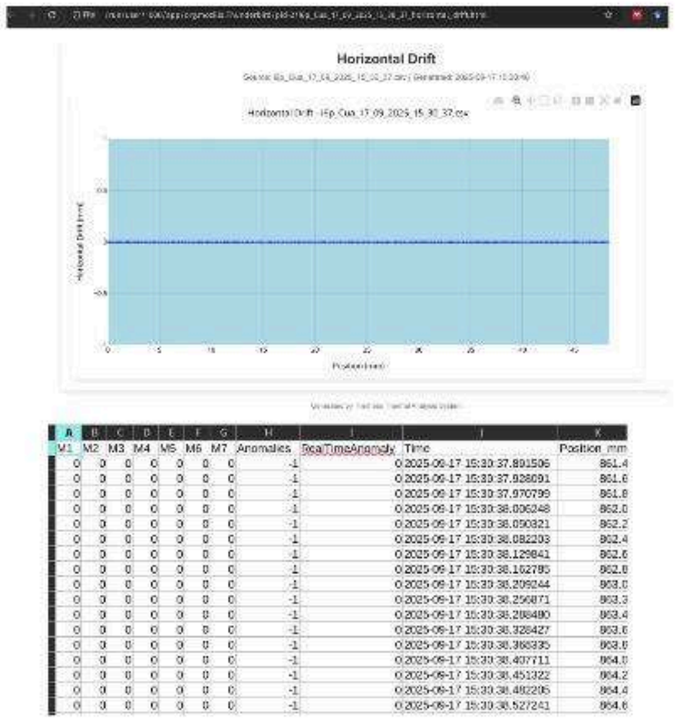
It includes the **HeatCam C, ML-CU GPU Server** and **HeatCore AI Software**.

Key Specifications:

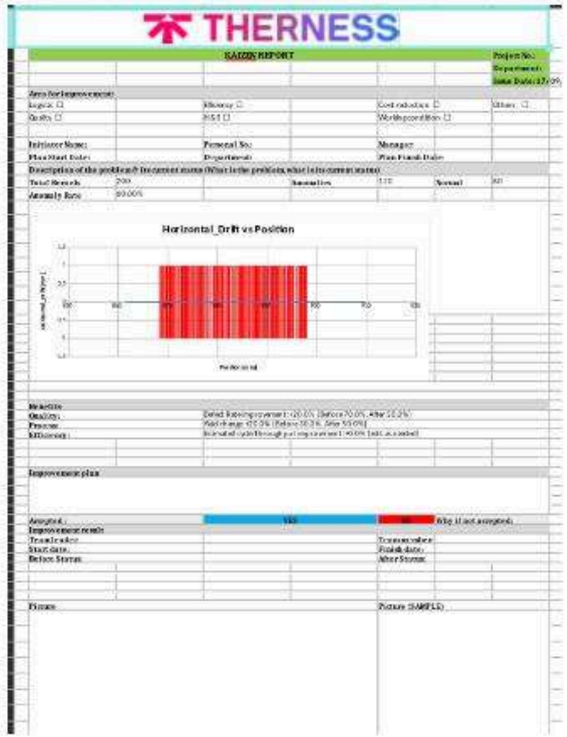
Weight: 270 g
Length: 7 cm
Frame Rate: 25 Hz
Air Purge System: Low-maintenance
Temperature Range: –20 °C to 1500 °C

AI-Driven *Process Improvement*

- **Real-time** anomaly detection triggers automatic root-cause analysis;
- System instantly generates a **Kaizen report** with all process metrics;
- Includes **improvement suggestions**, operator feedback and traceability;
- Enables **data-driven continuous improvement** without manual intervention.

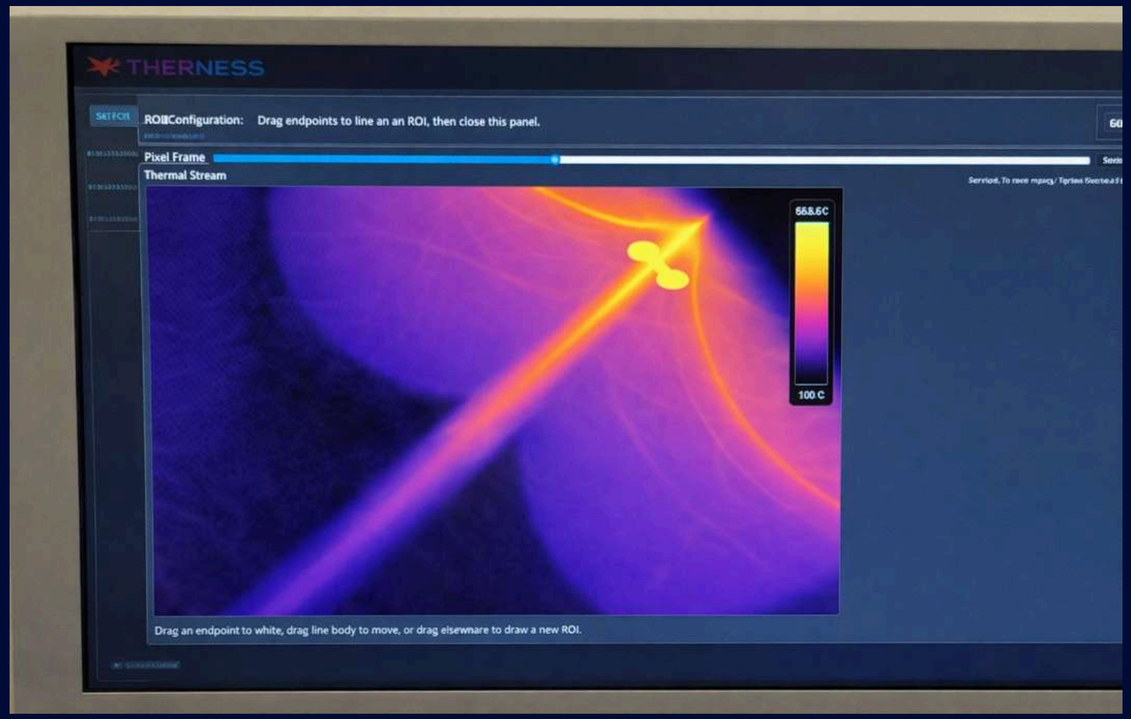


M1	M2	M3	M4	M5	M6	M7	Anomalies	RealTimeAnomaly	Time	Position_mm
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:37.891506	861.4
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:37.928091	861.6
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:37.970799	861.8
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.006248	862.0
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.050321	862.2
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.082203	862.4
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.120841	862.6
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.162795	862.8
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.209244	863.0
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.256871	863.3
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.298480	863.4
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.328427	863.6
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.368335	863.8
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.407711	864.0
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.451322	864.2
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.492205	864.4
0	0	0	0	0	0	0	-1	0	2025-09-17 15:30:38.527241	864.6



HeatScan

A product designed to support a specific application within the **induction welding** process of aluminum radiator tubes, which is a critical process in the automotive industry.



Real-time thermal visualization with ROI configuration. The INFERNO color map displays a range of 19.9–393.4 °C. The weld seam is clearly visible as the high-temperature band at the center of the image.

***WELD** PARAMETRES*

An add-on software that enriches process visibility by synchronizing electrical parameters with thermal data, enabling a broader and more reliable quality baseline.
↳ requires the WeldTrace or the PLC Integration module to read welding parameters directly from the plant PLC or Digital Welding Source.

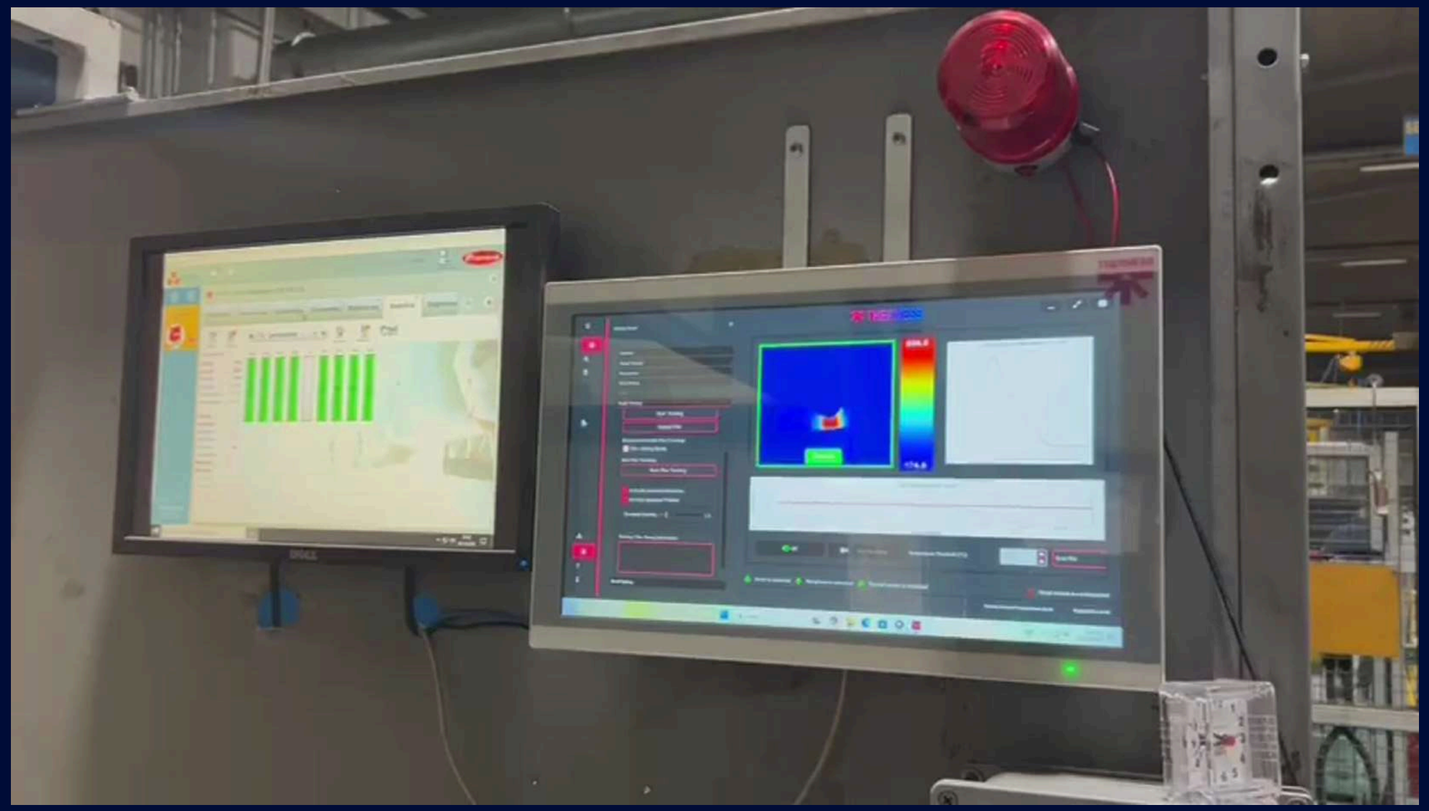
***WELD**TRACE*

A dedicated signal acquisition hardware for capturing critical welding parameters with precision and synchronizing them with thermal and AI-driven analysis.

ACQUIRED PARAMETERS

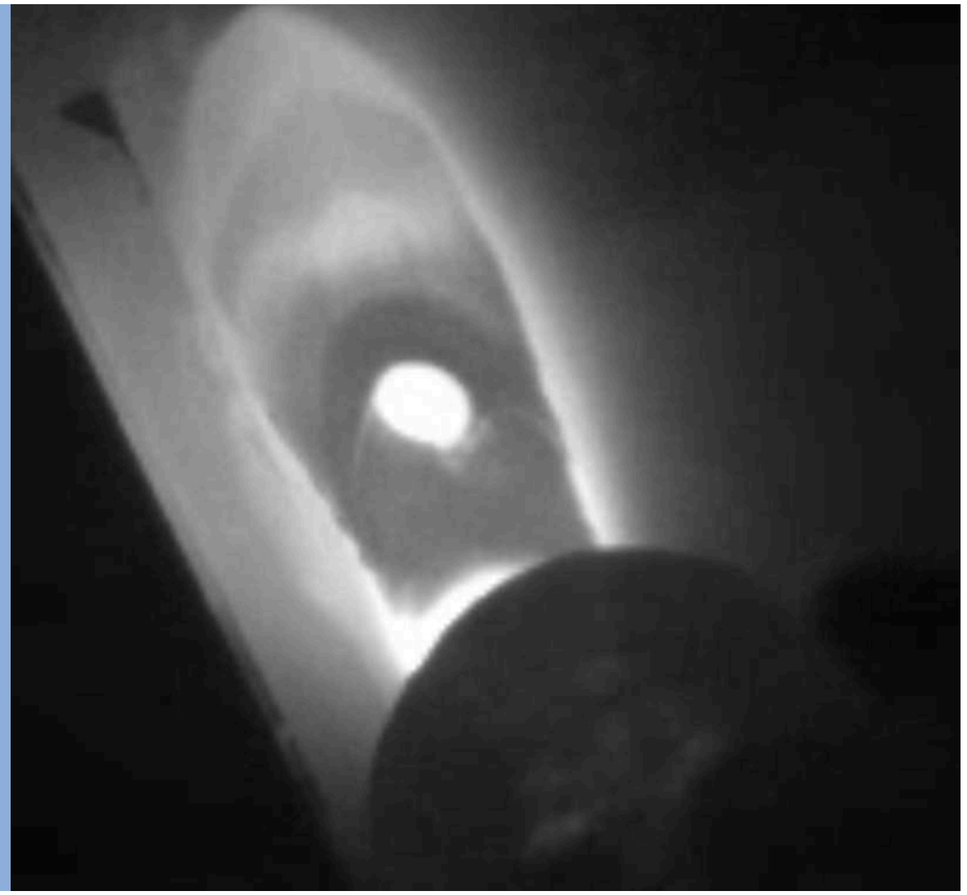
- Welding current (A)
- Welding voltage (V)
- Wire feed speed (m/min)
- Gas Flow (L/min)

REAL-TIME ALERT



INDUSTRIAL *APPLICATION*

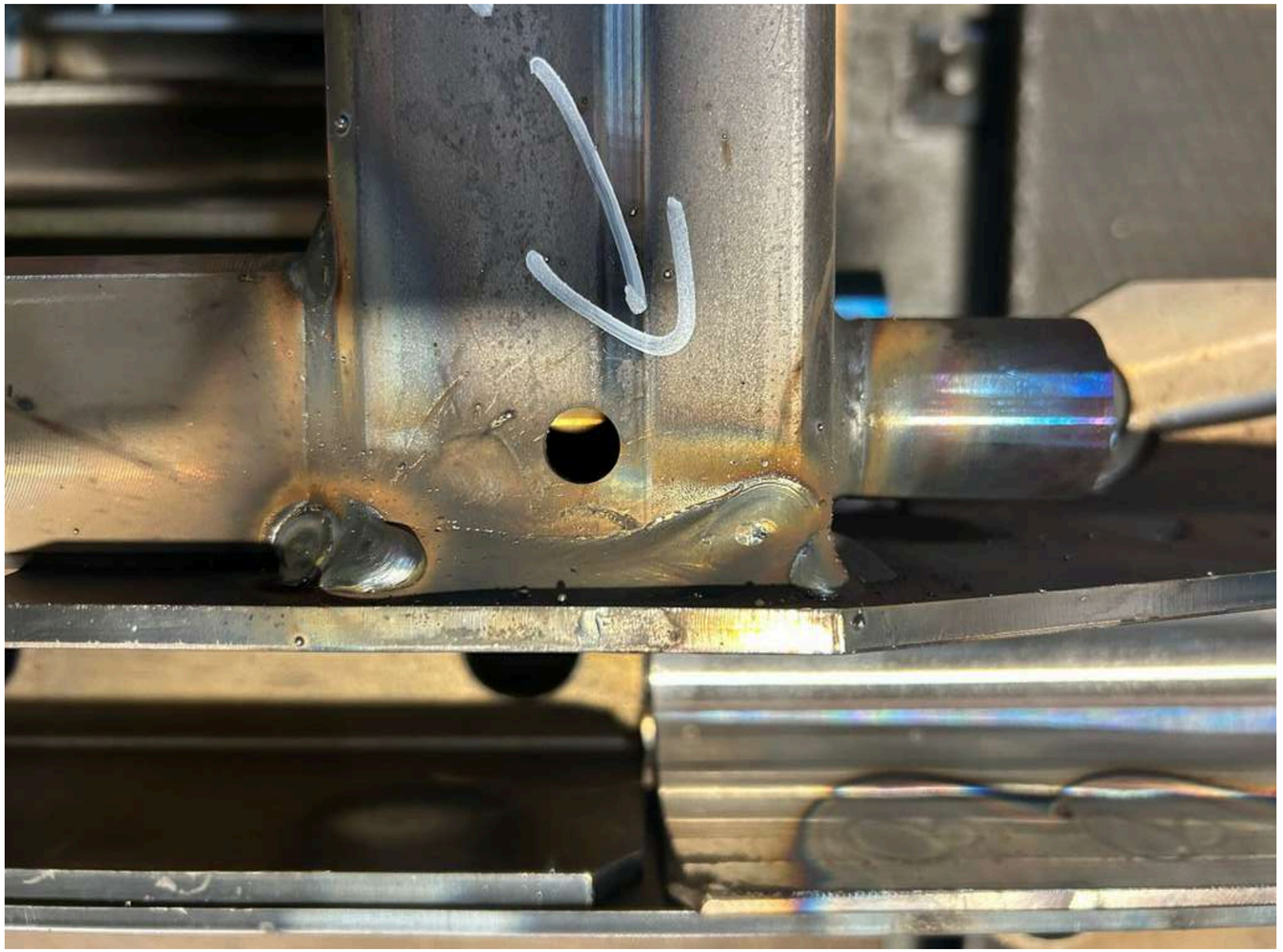
1. **Installation**
2. **Data & defect simulation**
3. **Comparison**
4. **Visualization**



INSTALLATION

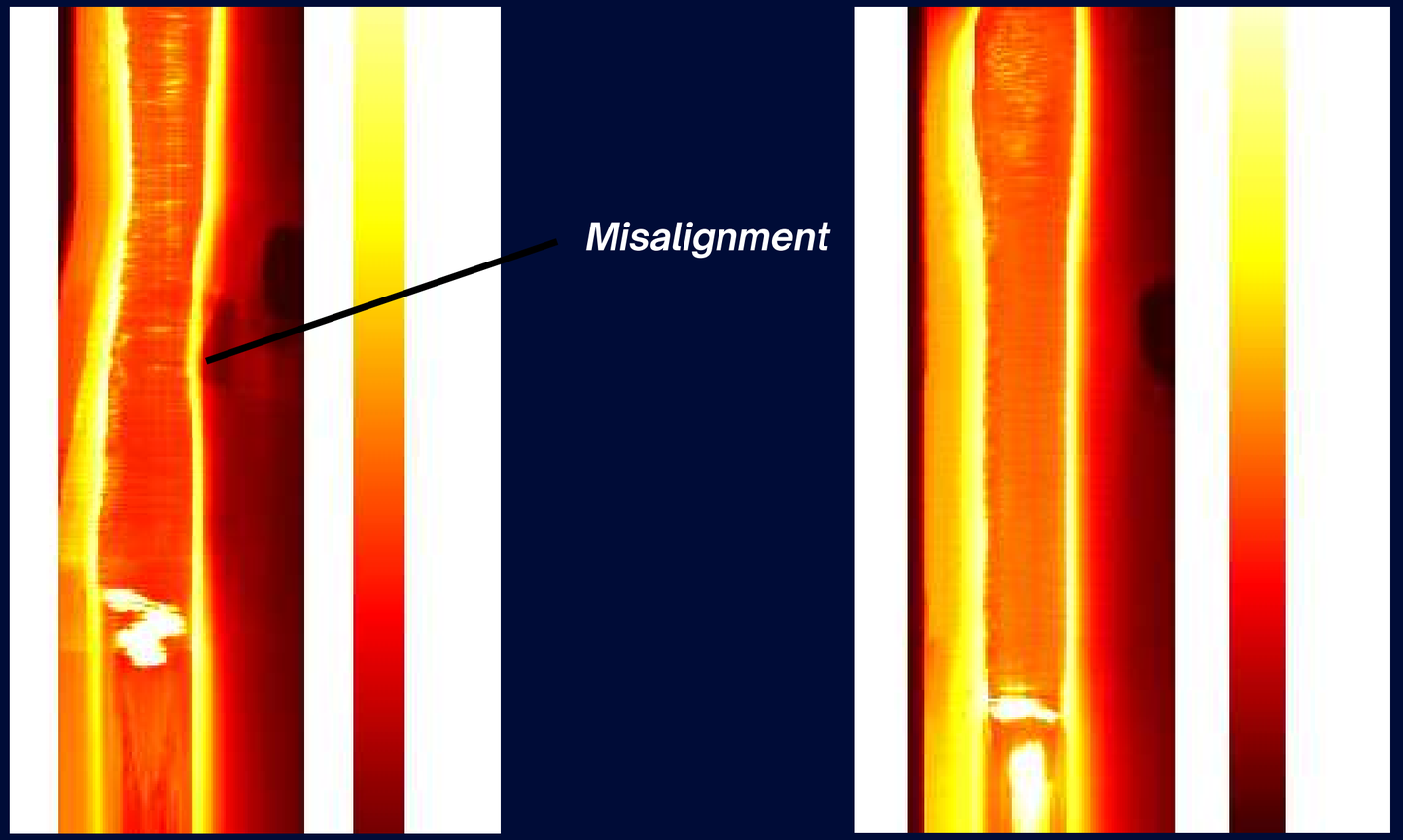
directly into your production lines.

DATA & DEFECT SIMULATION



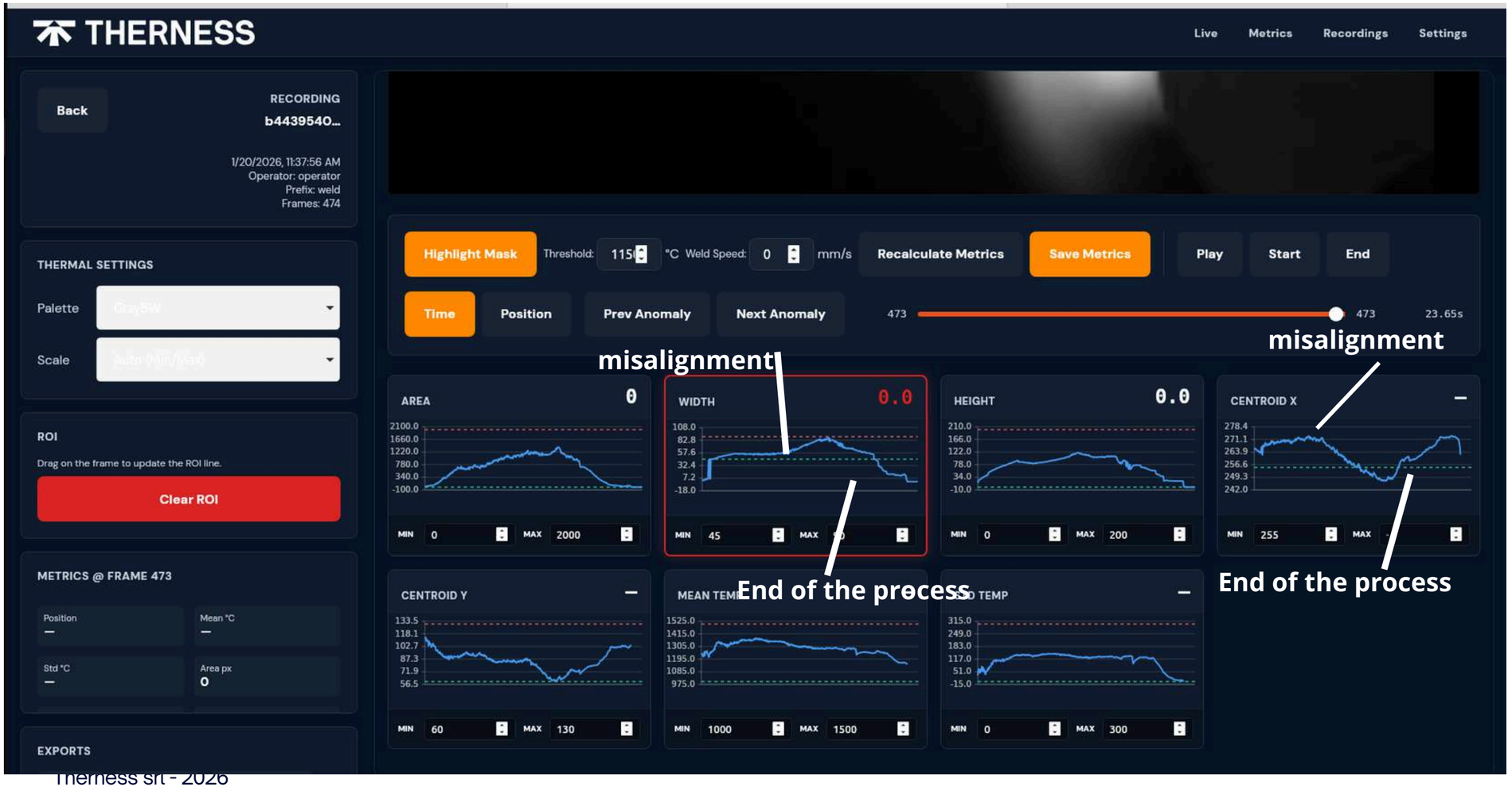
COMPARISON

Defective



Compliant

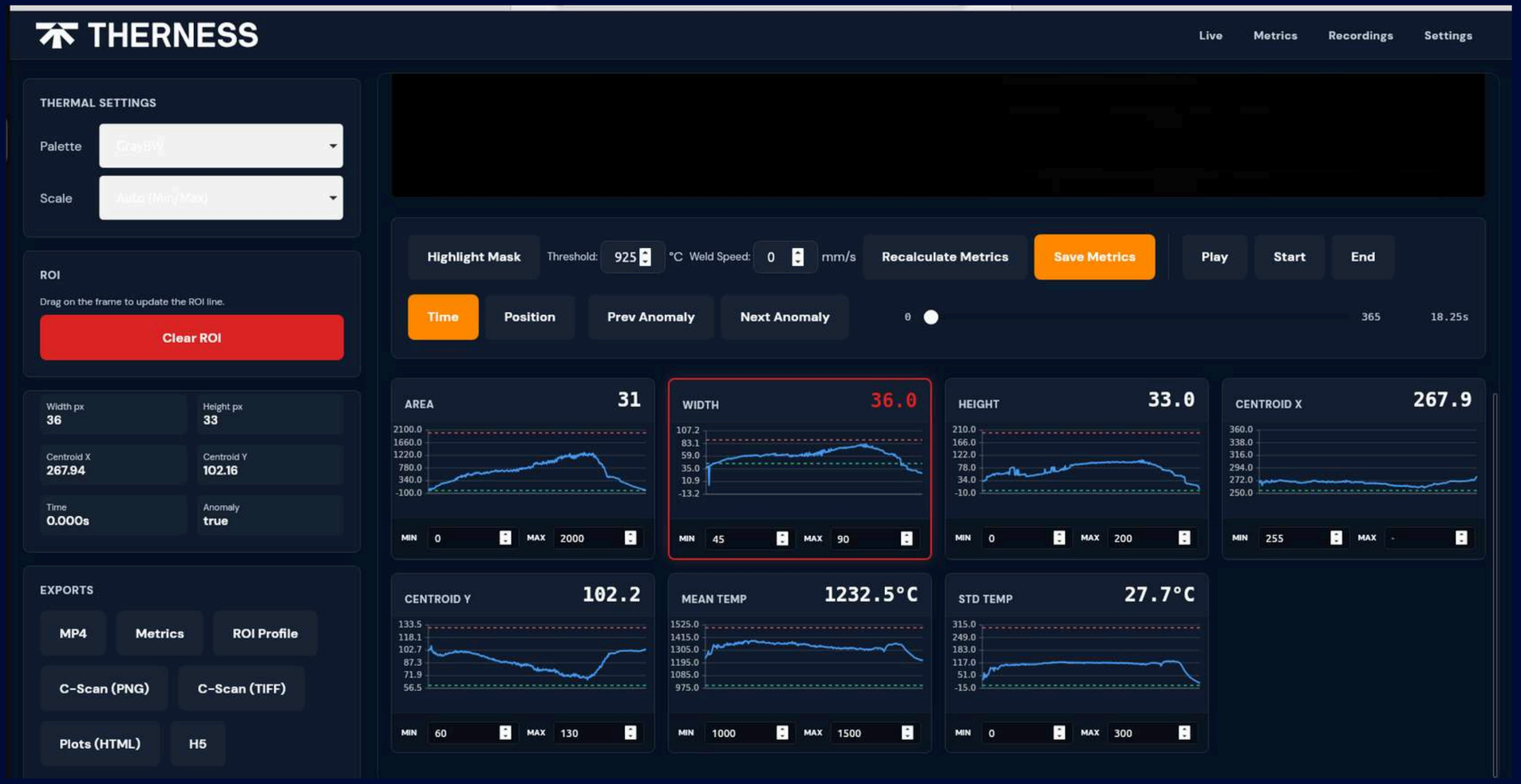
MISALIGNMENT DETECTION CASE



Defective case

The misalignment is visible both as an increase in width and as a shift of the centroid along the x-axis.

MISALIGNMENT DETECTION CASE



Compliance case

The parameters are within the limits for this type of welding.

REAL-TIME VISUALIZATION

→ Compliant Case

→ Defective Case

PROCESS VALIDATION & WELD QUALITY ASSURANCE

ISO-aligned monitoring and documented weld quality assurance

Standards Alignment:

UNI EN ISO 17635:2025 – Process monitoring method supporting NDT with 100 % thermal coverage and real-time evidence

UNI EN ISO 17637:2016 – Complies with Visual Testing (VT) requirements using camera-based inspection.
Therness ensures process control and full traceability across every weld

ISO

UNI
ENTE ITALIANO DI NORMAZIONE

INDUSTRIES

Energy & Power Generation

Shipbuilding & Heavy Industry

Rail & Infrastructure

Aerospace & Defense

Automotive & Mobility

Additive Manufacturing & Advanced Fabrication

MANUAL WELDING

- Designed for **manual or semi-automated** stations where thermal drift often goes unseen;
- See the weld pool, **catch overheating** and **log evidence** without complex setup;
- It’s possible to track **how much** and **how** each individual manual welder welds;
- Could be supplied with a **fiberscope** to make it compatible with **any welding machine** while **minimizing bulk.**

Thank *You*

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