



Łukasiewicz  
PIAP

**ŁUKASIEWICZ-PIAP - Research and Development  
Center for Automation and Robotization**

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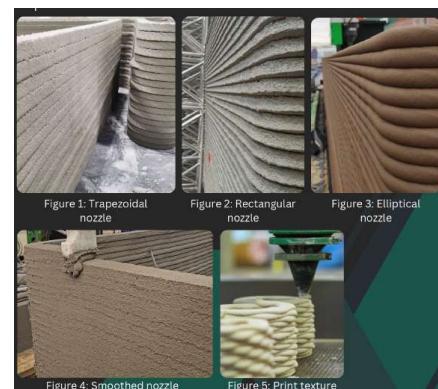
# Łukasiewicz-PIAP

RTO, system integrator, **mobile robots producer**, 300 workers.

Technology Centre: Robotics, Automation, CPS, IoT, Edge computing

**3D Scanning/Printing/Fast delivery of spare parts**

Digital Innovation HUB. ADRA, INSIDE member.  
EIT-ManufaturingHub Poland



Workshop Name

# Competencies

## 1. Our main activities:

- Automated and robotized work centres and production lines.
- New generations of control systems and drives for modernized production installations.
- Industrial measurement systems.
- 3D printing and scanning.
- Stations for visual inspection, monitoring and telemetry systems.
- Intelligent systems and mobile robots for special applications.
- Specialized test equipment installations for recycling of cars and household appliances.
- 2. Our expertise and skills we may bring to the project(s):

HORIZON-CL4-202X-TWIN-TRANSITION: MAAS/ Made in Europe Partnership

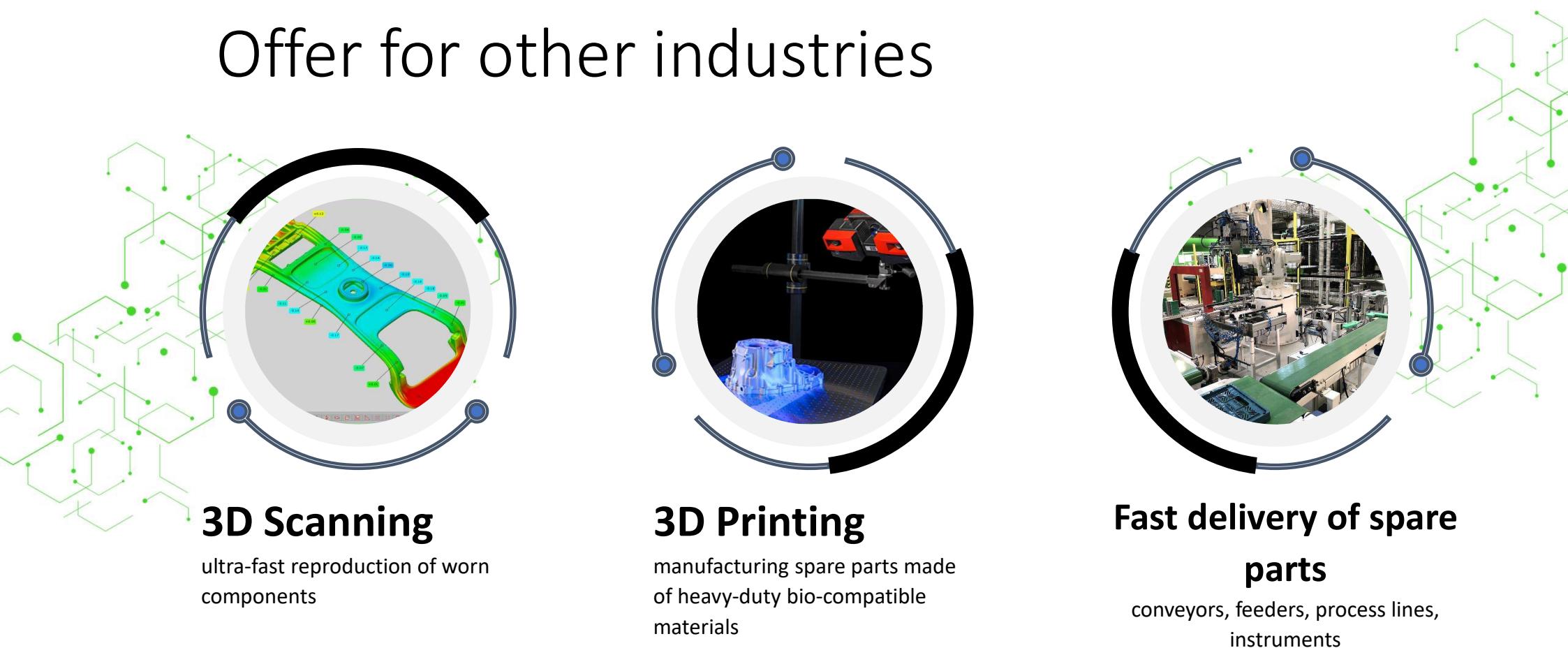
HORIZON-CL4-202X-DIGITAL-EMERGING

HORIZON-CL4-202X-HUMAN

## Research interest for CL4-6 2026

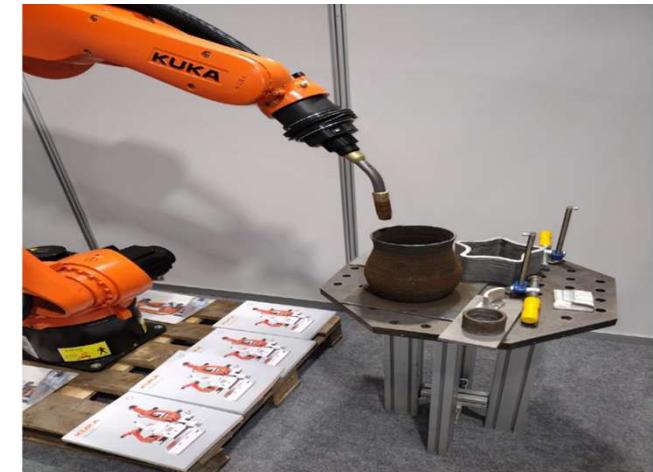
- **Remanufacturing** - AI based Robotized repair and circular valorisation of laptops and electronic devices. Implementation of AI-supported models for elements of laptops, image recognition and identification. **Machine learning algorithms** covering convolutional neural networks (**CNN**, e.g., **YOLO** - You Only Look Once) and Deep Neural Networks (**DNNs**), including attention mechanisms
- **Manufacture as a Service (MAAS)** - Sustainable and Agile Manufacturing with AI control. Manufacturing through the incorporation of AI-enabled concepts and tools
- **Circularity** (recycling and recovery of materials) - **Circular Economy** technology for efficient recovery of high-value materials by robotized disassembly of electronics waste.
  - Helping industry to respond to customers' demand for personalised products & services implementing **Smart specialization strategy**: National Smart Specialization "Automation and Robotics of technological processes".
  - **intralogistics with our AMR/AGV** - cloud based real-time data acquisition from AMR and **AI based data analysis on inventory, operations**, and other relevant factors, providing valuable insights for decision-making to enhance Flexibility and Adaptability

# Offer for other industries



# DIGITAL TWIN

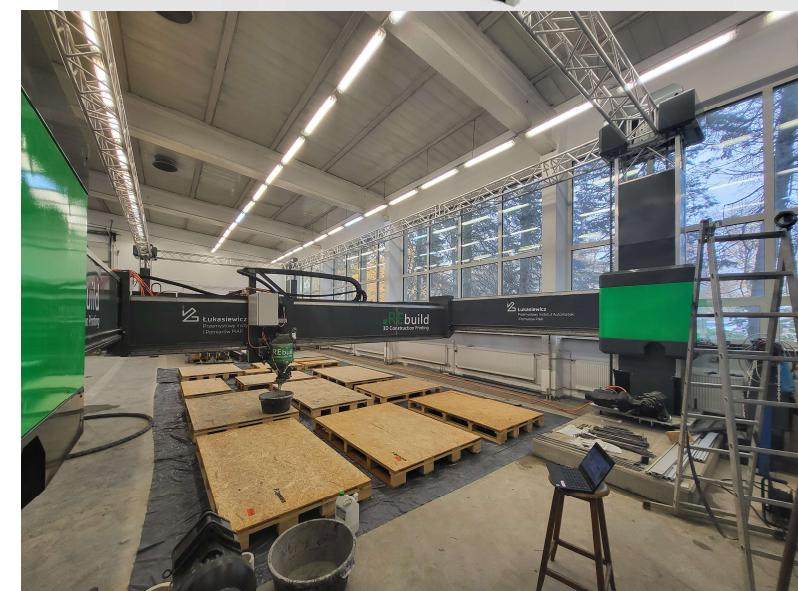
**CPS** for remote programming an industrial station for Wire Arc Additive Manufacturing (WAAM).



**Technology of a digital twin in virtual reality.**

Increases the **safety** of employees and enable remote cooperation with robots.

# 3D Construction Printing as a Service



# Sample Projects



Technical Stairs, Embankment – EŁK



Foundation Footings with Optimized Shape and as Lost Formwork



Model of a Technical Building



Concrete Planters - Non-Planar Printing; Color Printing



Figure 1: Trapezoidal nozzle

Figure 2: Rectangular nozzle

Figure 3: Elliptical nozzle



Figure 4: Smoothed nozzle



Figure 5: Print texture

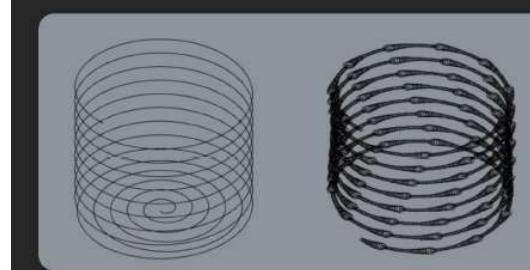


Figure 1: Printing path

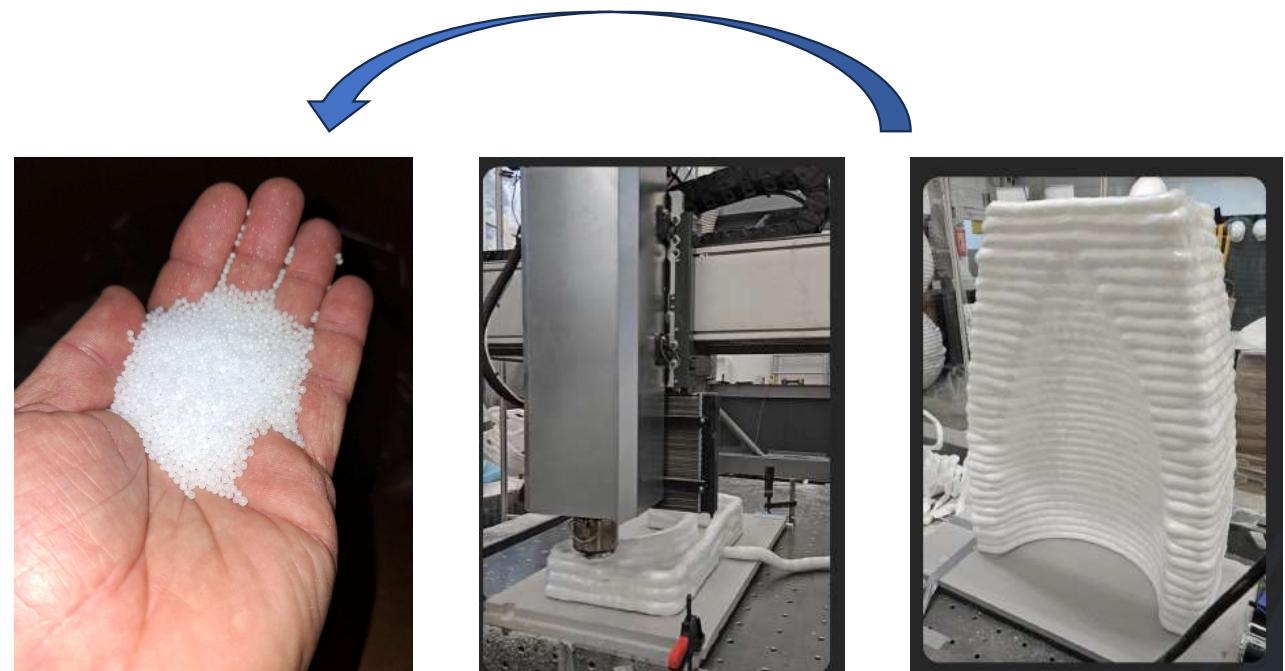
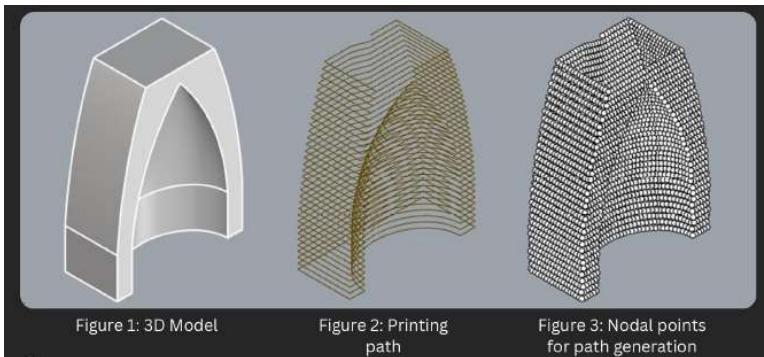


Figure 2: Printing path with a visible change in extrusion parameters

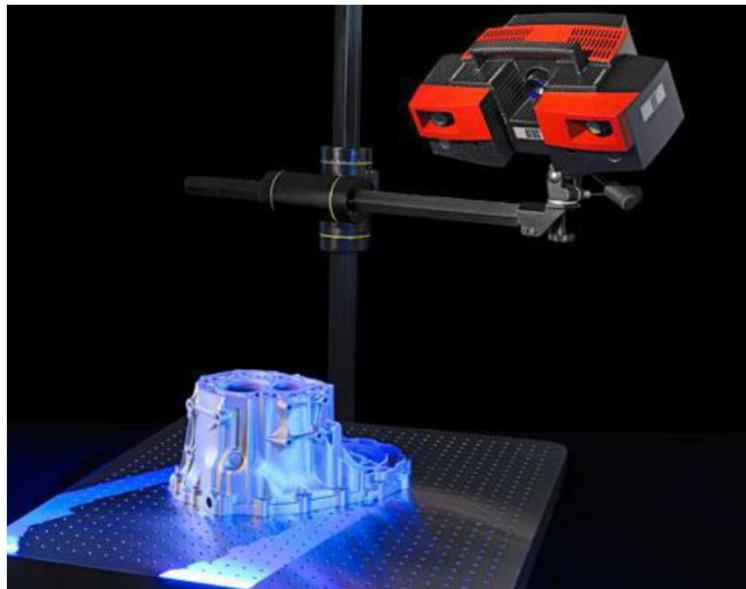


Figure 3: Final print

# Foamed Polystyrene Extruder - FPE



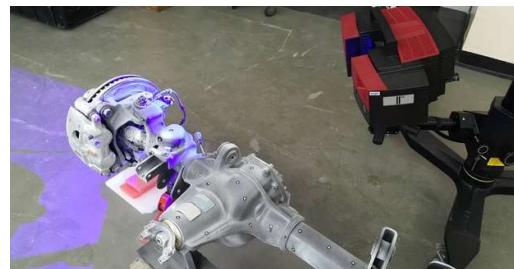
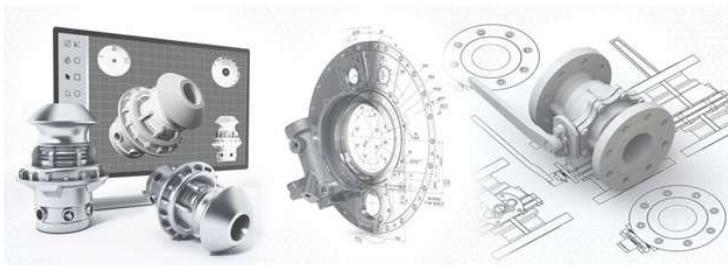
Production of parts using **industrial 3D printing** from any kind of materials - from polymers to metals and their alloys



# Industrial Inspection System

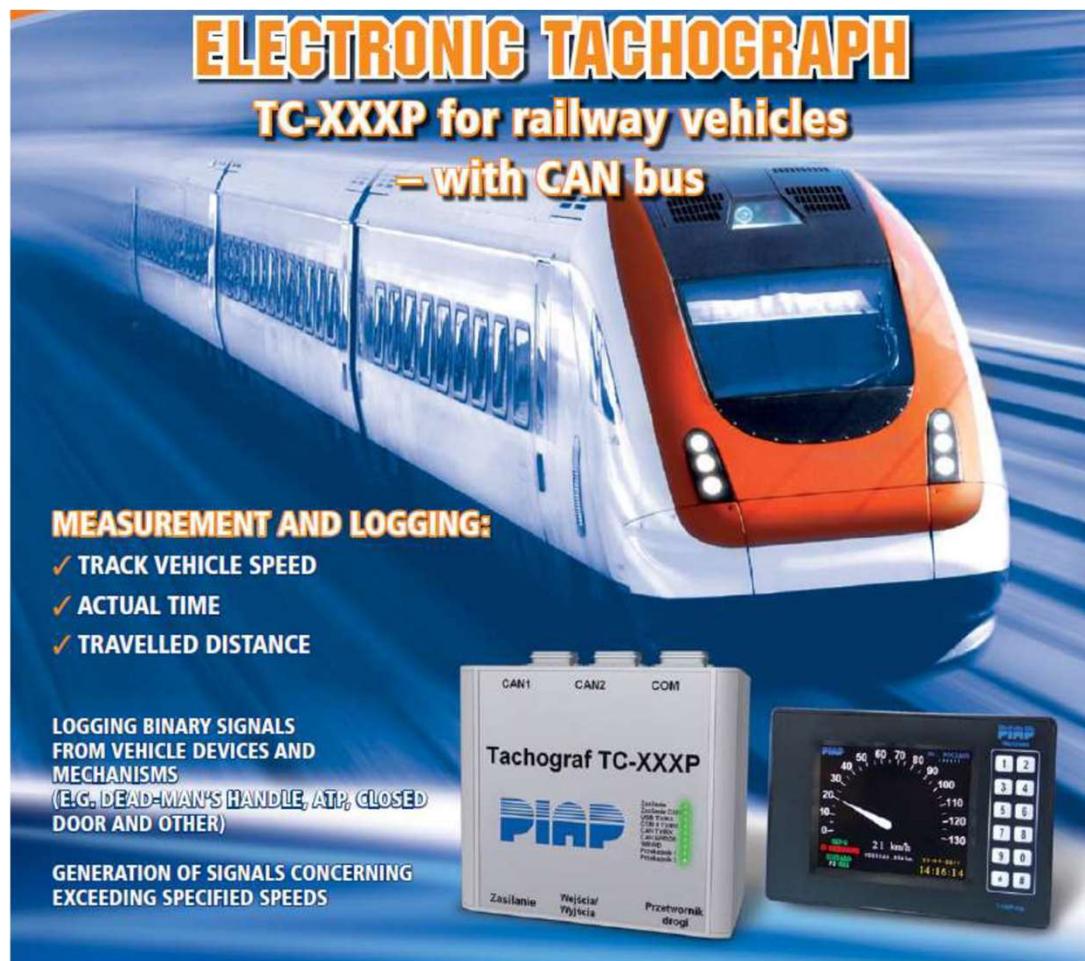
Designing prototypes dedicated for target manufacturing technology.

Quality control in relation to CAD.



# Production to railway

**ELECTRONIC TACHOGRAPH**  
**TC-XXXP for railway vehicles**  
**– with CAN bus**



**MEASUREMENT AND LOGGING:**

- ✓ TRACK VEHICLE SPEED
- ✓ ACTUAL TIME
- ✓ TRAVELED DISTANCE

LOGGING BINARY SIGNALS  
FROM VEHICLE DEVICES AND  
MECHANISMS  
(E.G. DEAD-MAN'S HANDLE, ATP, CLOSED  
DOOR AND OTHER)

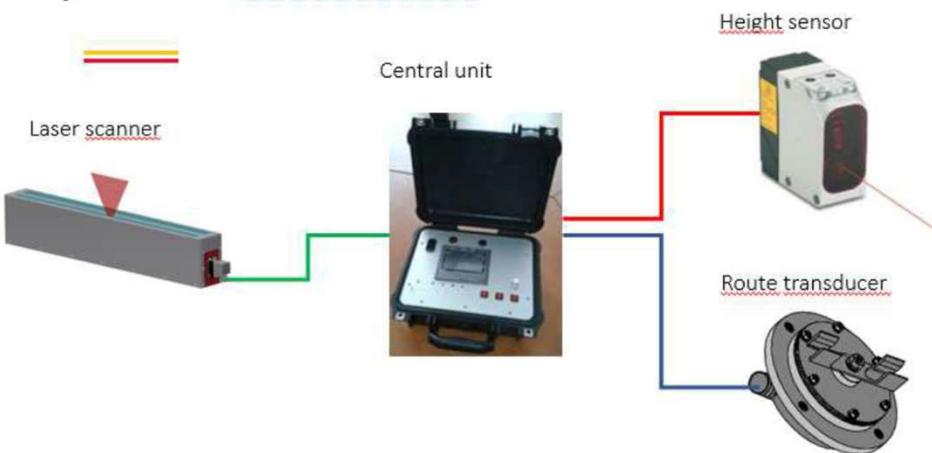
GENERATION OF SIGNALS CONCERNING  
EXCEEDING SPECIFIED SPEEDS

**Tachograf TC-XXXP**  
**PIAP**

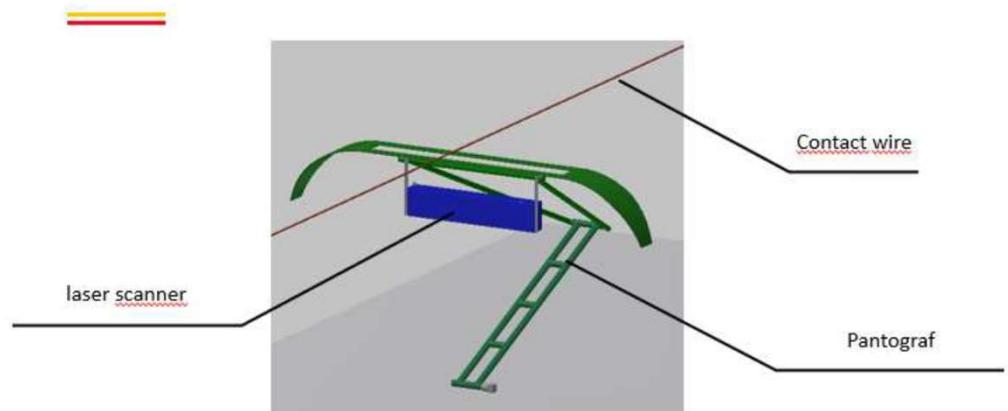
The image shows a high-speed train in motion, blurred background, with a tachograph unit in the foreground. The tachograph unit is a rectangular device with a display screen and a keypad. The display screen shows speed in km/h and time. The keypad has numbers 1-9 and 0, along with other function keys. The device is labeled 'Tachograf TC-XXXP' and 'PIAP'.

# Diagnostic & Inspection system of contact wire exhaustion

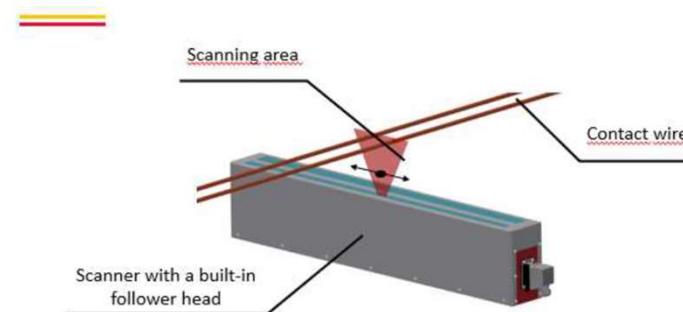
## System structure



## Laser scanner fitting



## Laser skanner



# Robotics applications for manufacturing SMEs

- palletising, depalletising,
- welding, bevelling (including plasma bevelling),
- assembly, handling,
- transport between stations,
- packaging,
- weighing out and batching,
- coating, grinding

