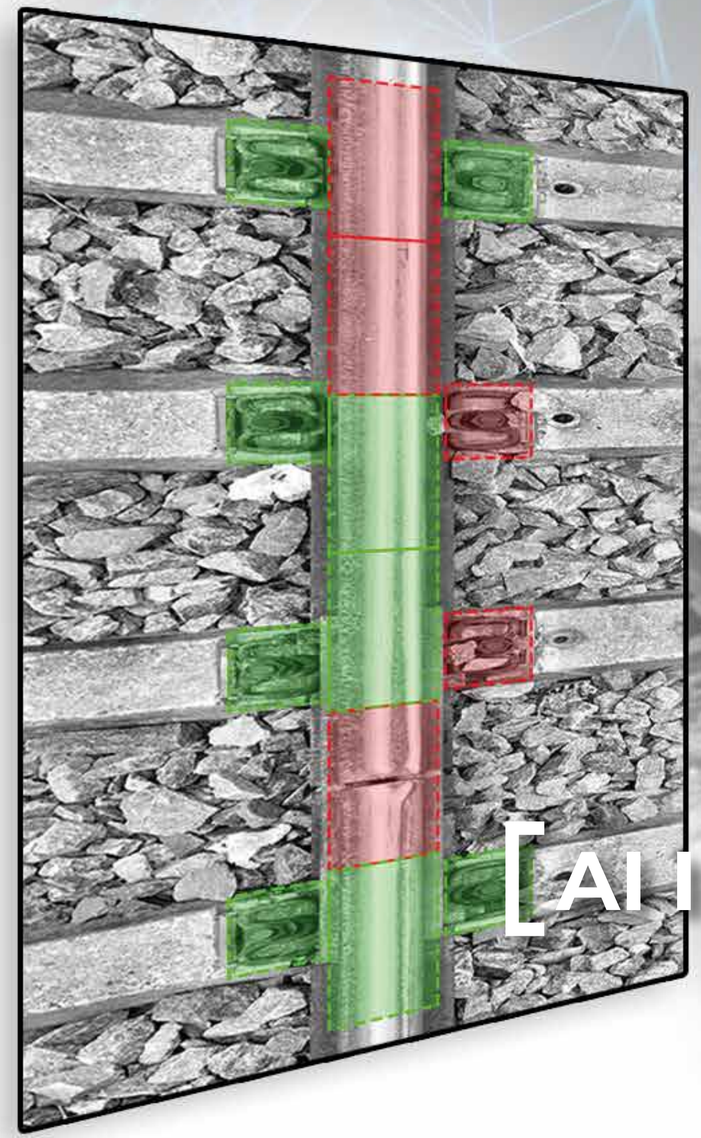
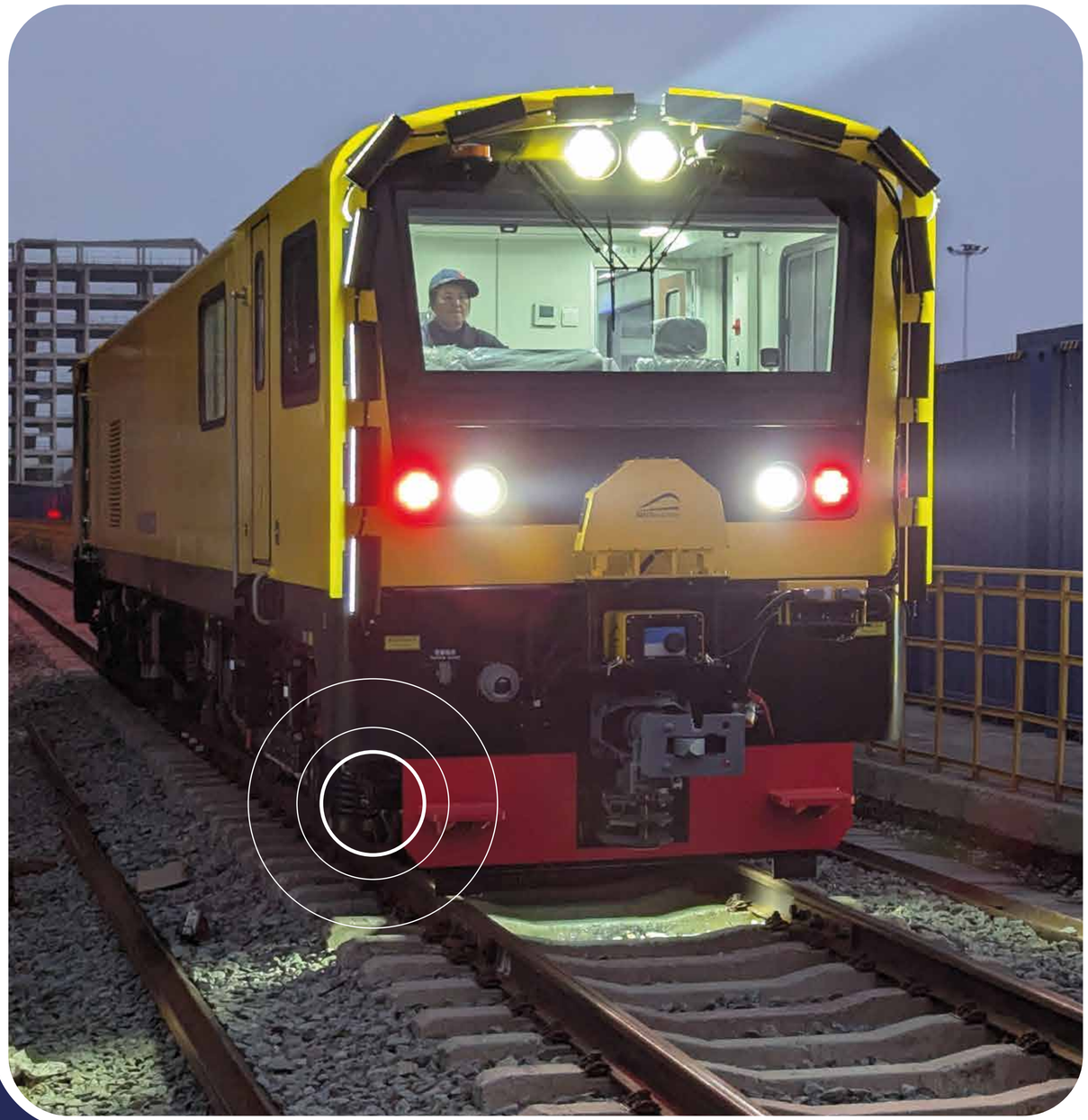
Track Imaging

High-Resolution Imaging Systems for High Speed Railway Inspection



[AI Integrated]

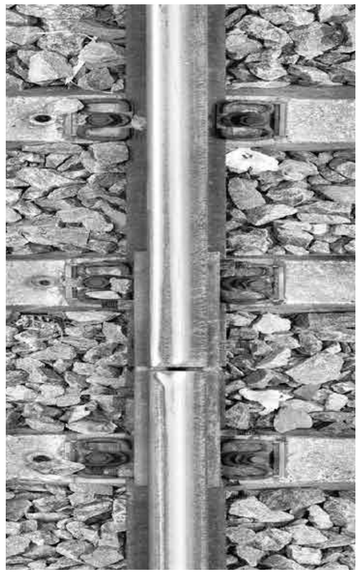
ADTSOLUTION



ADTS Track Imaging Systems are designed for **high-resolution visual inspection** of railway infrastructure components such as **rails, fasteners, fishplates, sleepers and ballast**.
Using **high-definition cameras**, they capture submillimeter images at high speed, enabling detailed surface analysis in various operating conditions.

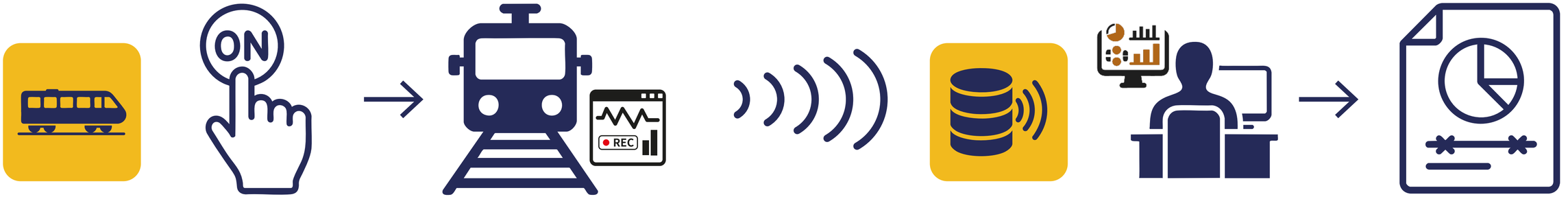
Easily mountable on **different vehicles** and **configurable to match inspection needs**, they ensure precise acquisition even at full speed, with **AI-powered automatic defect detection**.

Ultra High Resolution	AI-Powered Diagnostics	High-Speed Operation	Extreme Environment	Energy Efficient



Performance	
Resolution	Up to 0,05 mm/px
Image Type	Color (RGB) or Mono
Max Speed	Up to max operational speed
Target distance	Up to 1000 mm
Operating temp.	-20°C / + 50°C
Humidity	15 to 85%
Lighting Power	100.000 Lux
Voltage	24 VDC or 220-110 VAC

How Track Imaging Systems work



System Startup: The Track Imaging System is activated.

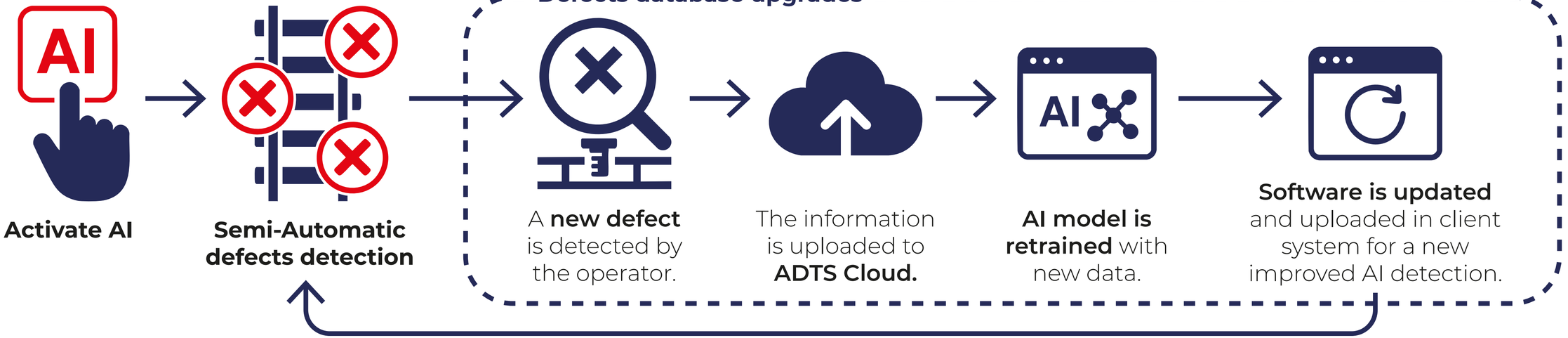
Data Acquisition: Scanning begins via **Gilgamesh** software and onboard sensors.

Acquired data is transferred to office servers.

Data Analysis: Ahmes software processes the information.

Report Generation: Results are compiled into structured, web-accessible reports.

the AI semi-automatically identifies defects



Activate AI

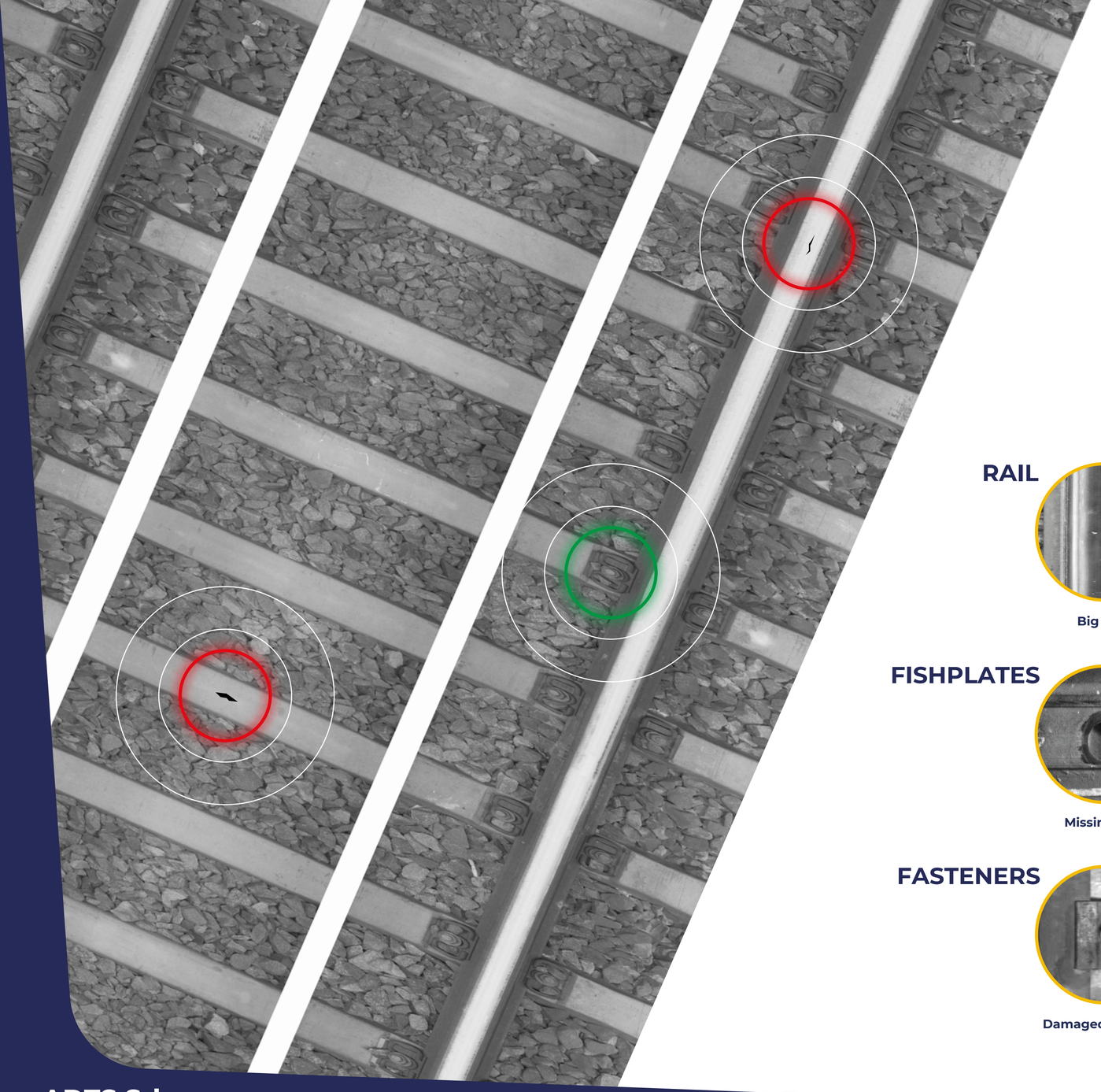
Semi-Automatic defects detection

A **new defect** is detected by the operator.

The information is uploaded to **ADTS Cloud.**

AI model is retrained with new data.

Software is updated and uploaded in client system for a new improved AI detection.



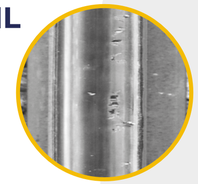
AI-Enhanced Inspection

Integrated artificial intelligence empowers the **Track imaging Systems to autonomously detect and assess**:

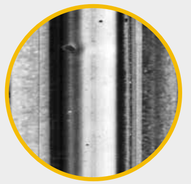
- Cracks and surface defects;
- Presence and alignment of components;
- Deformations and wear;
- Structural integrity indicators.

Defects Catalogue

RAIL


Big Hole

Wheelburn

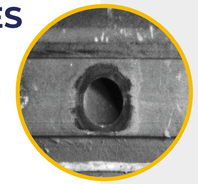

Black Spot

Crack

Big Rail-Gap

No Rail-Gap

FISHPLATES

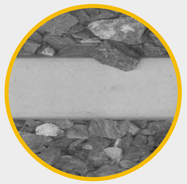

Missing Bolt

Loose Bolt

SLEEPERS

Crack

Flaking


Foreign Material

FASTENERS

Damaged Fastener

Rotated Fastener

Missing Bolt

Missing Fastener

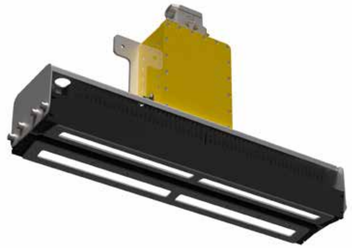
Trainable and customizable on request

Models and Configurations

HRS

High-resolution imaging
for targeted inspections

Resolution	0,05 mm/px
FOV	ca. 300 mm



HRSW

For full-track coverage with
multiple synchronized units

Resolution	0,1 mm/px
FOV	ca. 600 mm

V3DS

Integrates laser triangulation
for enhanced 3D imaging

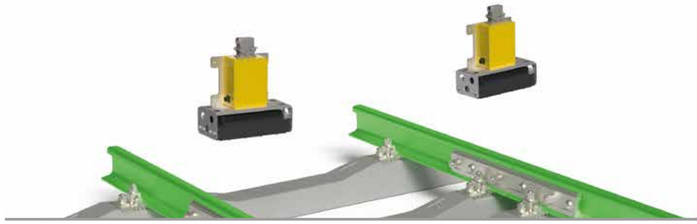
Resolution	0,1 mm/px
FOV	600 mm

Side Rail Configuration

Devices:
- **4 x HRS**

Defects detection:
- **Fishplates**

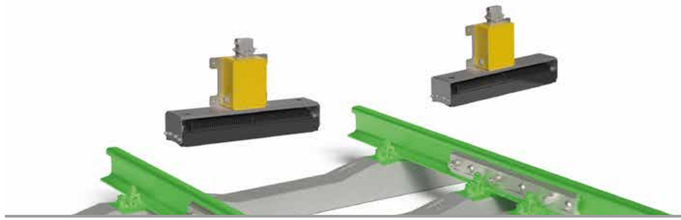
Rail Surface Configuration



Devices:
- **2 x HRS**

Defects detection:
- **Rail**

Rail View Configuration



Devices:
- **2 x HRSW**

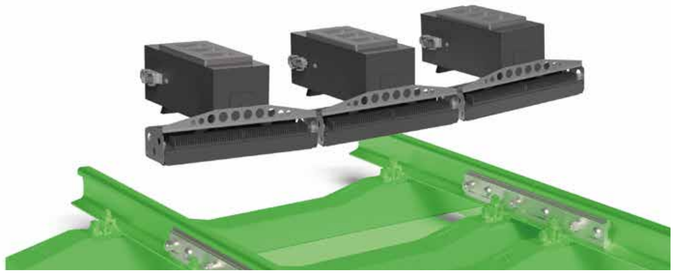
Defects detection:
- **Rail**
- **Fasteners**

Full Track Configuration

Devices:
- **3 x HRSW**

Defects detection:
- **Rail**
- **Fasteners**
- **Sleepers**

3D Full Track Configuration

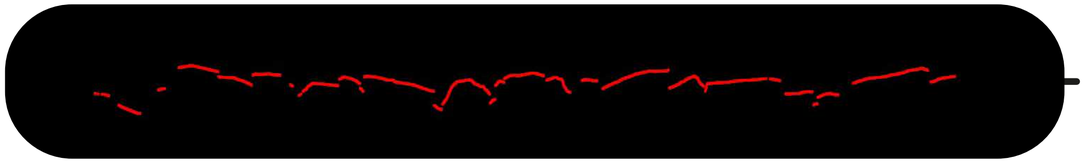


Devices:
- **3 x V3DS**

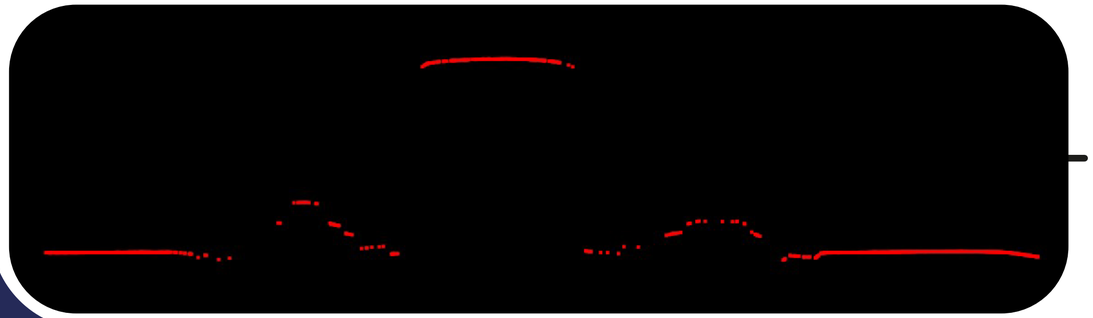
Defects detection:
- **Rail**
- **Fasteners**
- **Sleepers**
- **Ballast**

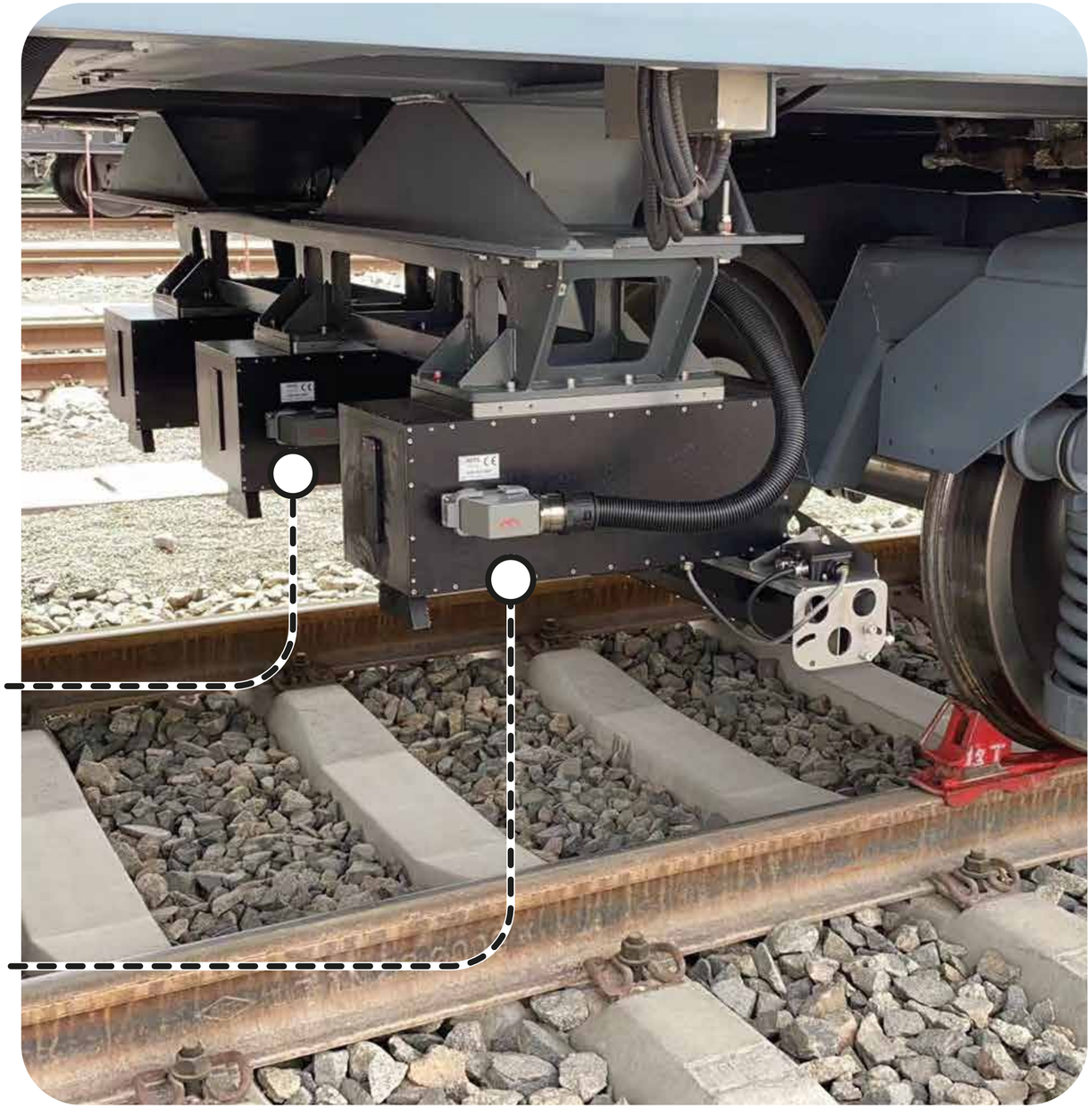
The 3D Full Track Configuration with **three V3DS units** enables the simultaneous acquisition of the **railway track's 3D shape and high-resolution images**, which are then **correlated through dedicated analysis software**.

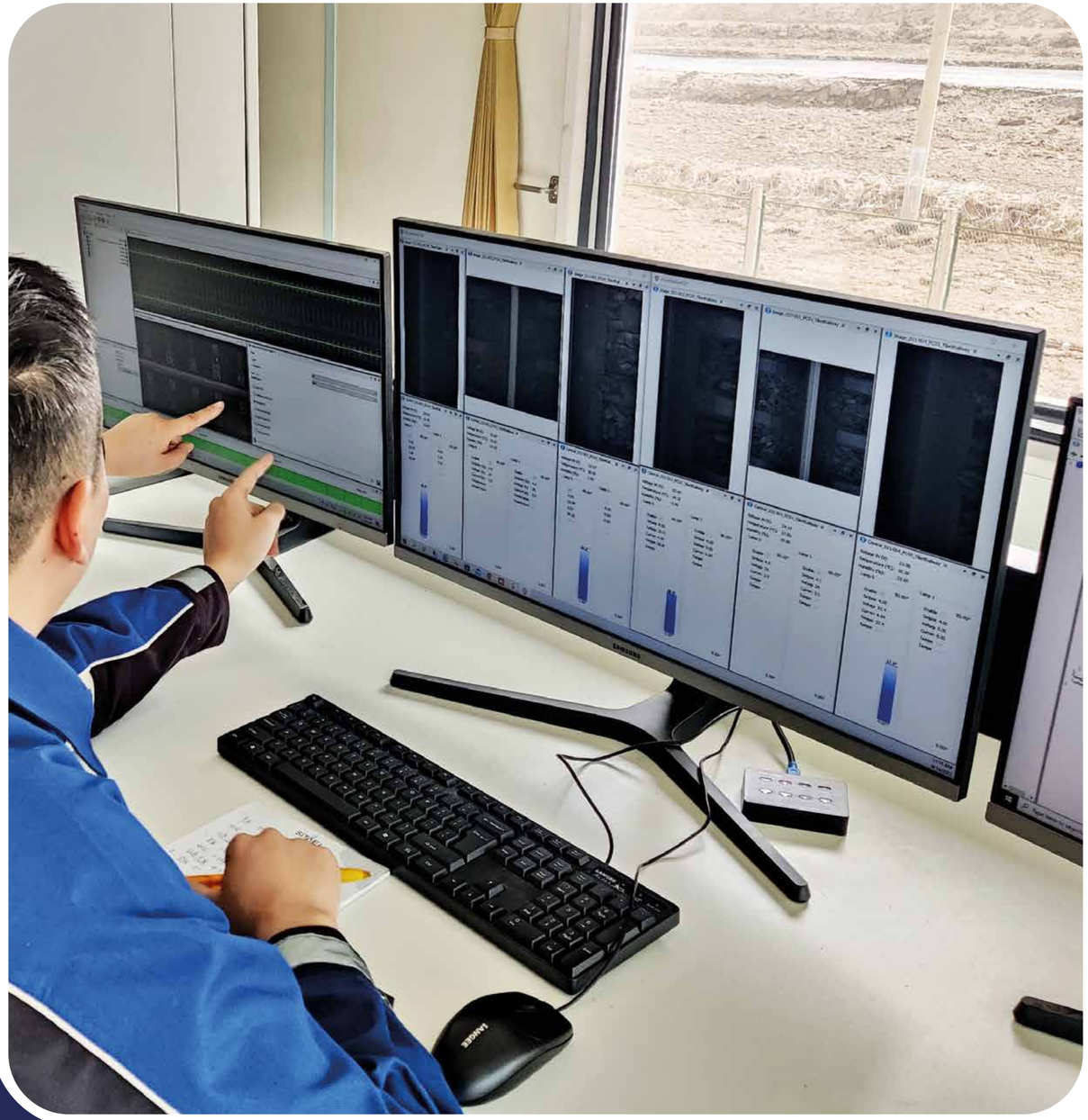
Typical Ballast Profile



Typical Railway Profile







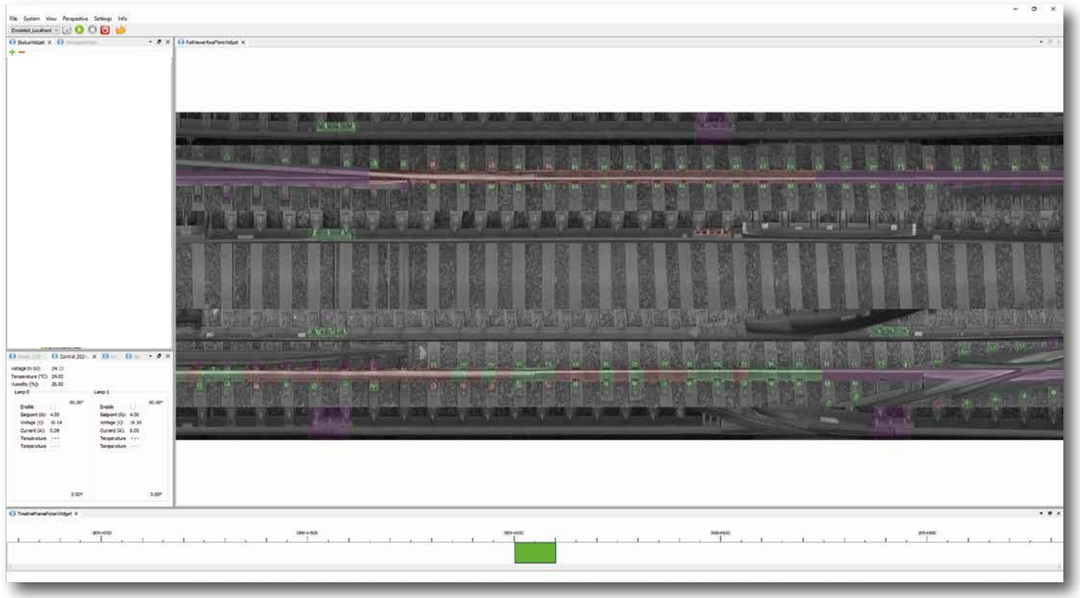
Ahmes Software

Ahmes is the **proprietary software used to analyze data** collected by **ADTS Track Imaging Systems**, either directly on board or remotely.

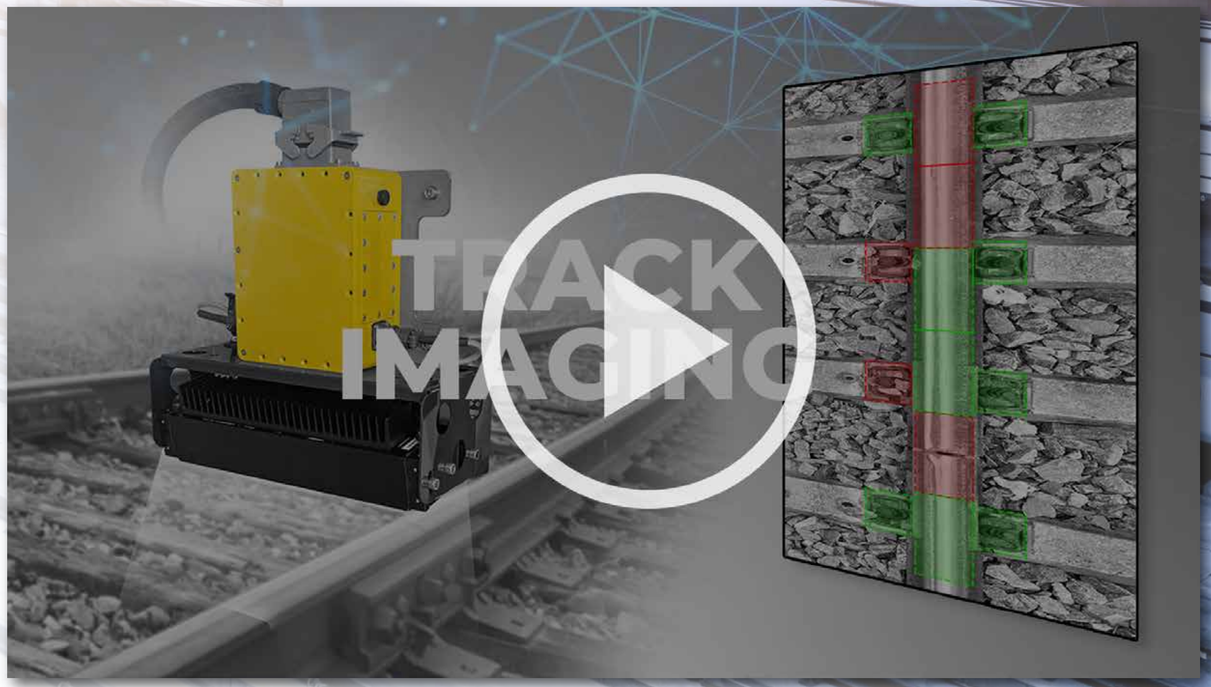
It allows operators to:

- **Navigate and inspect images in detail**, with tools to adjust visual quality, add notes and highlight relevant areas.
- **Run AI**-based automatic defect detection
- **Export results** in multiple formats for further analysis or integration

Ahmes combines automation and expert control to streamline inspection workflows and support informed maintenance decisions.



ADTSOLUTION



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