

INDUSTRIAL

PASAWIS

Phased Array Semi-Automated Wheelset Inspection System



EVIDENT

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Get outstanding coverage of wheelset components for **faster, more efficient inspections** with Evident's Phased Array Semi-Automated Wheelset Inspection System (PASAWIS).

Developed in collaboration with Fraunhofer IZFP and RailMaint, this powerful testing platform combines the latest ultrasonic and phased array scanning technology with dedicated software to meet the **European Rail Service's VPI-EMG 09 regulation** for NDT maintenance. With a complete step-by-step workflow, the software guides you through the inspection procedure from functional checks to results and report creation.

Key Benefits

- **Easy to use**

Guided inspection procedures with dedicated layouts for data representation

- **Fast**

With dedicated scanner kits for each inspection: axle, rim, or tread

- **Reliable and repeatable**

The human factor is limited to a minimum

- **Traceable**

All data is registered, including the coupling check, axle transfer correction, and missing data points control

- **Compliant**

Verified and approved in accordance with VPI-EMG 09



PASAWIS

Fast and Reliable

In contrast to conventional ultrasonic testing (UT) platforms that use a series of single element transducers and manual searching, phased array ultrasonic testing (PAUT) with electronic scanning uses multiple probes in a dedicated scanner, eliminating manual search and increasing the inspection speed and reliability.

PASAWIS is compact, featuring a base unit on wheels for easy maneuvering. This mobile system is easy to deploy anywhere and is operated by a single person, making it well suited for almost any workshop.

Ultra Fast Inspection Speed

Perform complete inspections 4x faster with PASAWIS compared to conventional UT inspection. Bespoke acquisition software ensures that every mandatory step is quickly performed to the highest standards.

Maximum Efficacy with Minimal Training

Achieve the efficacy of a fully automated system with a semi-automated solution. The PASAWIS user interface provides a complete guided workflow, ensuring that only necessary inspection steps are performed. Since the software is optimized for wheelset inspection it is much easier to use than a typical flaw detector.

Optimized for Specific Wheelset Components

PASAWIS can be paired with three handheld scanners, each optimized for a different wheelset component: axle, rim, and tread. These dedicated PAUT scanners fit flush with each wheelset component to accelerate inspections and provide complete coverage, giving inspectors the information they need to find relevant indications, like fatigue cracks.



Axle scanner



Wheel rim scanner

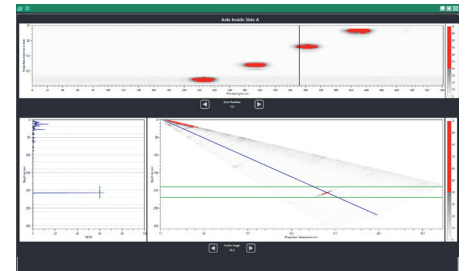
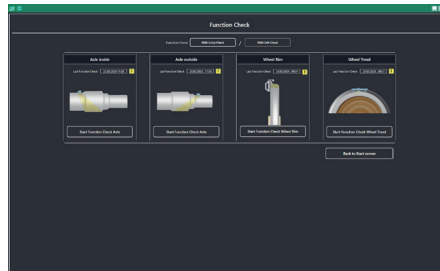
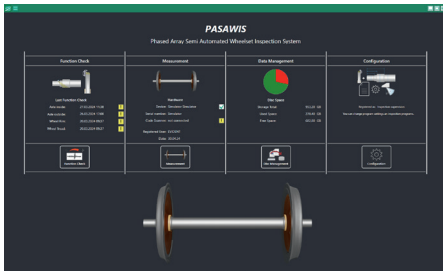


Wheel tread scanner

PASAWIS Software

Avoid Mistakes with Dedicated Software

Minimize the human impact on data collection and its results with a step-by-step software environment that guides operators through the inspection procedure. With two-level access, PASAWIS software ensures operators only access the necessary inspection workflow while following supervisor requirements. This is key to achieving reliable results independently from the operator performing the inspection. Dedicated to wheelset inspections, PASAWIS software provides pre-defined inspection programs optimized for each wheelset component, while a large, integrated touch screen monitor provides a clear view of wheelset components and test data.



Discover the Benefits

- **Dedicated to wheelset inspections**
- **Guided workflow that walks the user through inspection procedures**
- **Specialized layouts with result presentations**
- **Customized color palettes for data representation**
- **Embedded inspection procedures with wheelset types and function check procedures**
- **Automatic coupling check during inspections (for axle and rim)**
- **Automatic control of missing data points**
- **Automatic transfer correction function for axle inspections**
- **Wheelset database with ability to create additional databases**
- **Full inspection data registration and storage**
- **Customized and automatic reporting**
- **Two levels of access: supervisor and inspector**
- **Easy language selection**

Traceable and Reproducible

In addition to making inspections quicker and easier, PASAWIS provides robust data storage capabilities, including integration with cloud-based document management platforms. Unlike other wheelset inspection tools, PASAWIS provides comprehensive storage of all inspection test data, ensuring long-term traceability and reproducibility.

Once the inspection is complete, PASAWIS creates inspection reports with minimal input. Graphical results for each wheelset tested, e.g., A-scan, sectorial image, and C-Scan, as well as several key metadata such as calibration date, instrument serial number, and inspector are included in the report, which comes in a PDF format. Additionally, users can analyze data offline in PASAWIS data

analysis software, which is provided alongside the PASAWIS system, allowing for thorough examination and interpretation of inspection data at their convenience.

Specifications



Base unit specifications:

Dimensions: 1195 mm × 615 mm × 605 mm (47 in. × 24.2 in. × 23.8 in.)

Weight: 110 kg (242.5 lb)

Wheels: diameter: 200 mm (7.9 in.), width: 65 mm (2.6 in.) made of rubber

Water management system and scanner encoder switch

Data storage: 512 GB SSD + 1 TB SSD

Monitor: 24-inch touch screen monitor

Installed software: single user license for inspection software and single user license for offline analysis software



Axle scanner specifications:

Dedicated to solid axle inspection with diameters 130–180 mm (with standard wedge; for bigger diameters, an additional wedge is needed)

Phased array inspection of the axle wheel seat area from journal and shaft position with automatic coupling check function

Integrated encoder and coupling system

Latch mechanism with diameter adaptation

Includes phased array probe, wedge, two spacers, and transport case



Wheel rim scanner specifications

Dedicated to wheel rim inspection with wheel diameters 750–1000 mm (29.5–39.4 in.)

Phased array inspections of wheel rim and conventional UT inspections of wheel flange (two directions at the same time) with automatic coupling check function

Integrated encoder and coupling system

Magnetic mechanism for scanner attachment and spring-loaded probe holders

Includes two phased array probes with wedges, two conventional transducers, and transport case

Specifications



Wheel tread scanner specifications:

Dedicated to wheel tread inspection with wheel diameters 600–1000 mm (23.6–39.4 in.)

Phased array inspection of wheel tread area (rolling surface), with visual coupling check

Integrated encoder and coupling system

Spring-loaded probe holder

Includes phased array probe, wedge, and transport case

System UT/PA Specifications

Phased array channels	64
Number of pulsers	16
Conventional UT channels	4 (8 UT connectors)
Data acquisition rate	Up to 30 MB/s
Acquisition speed	Up to 20000 12-bit A-scans/second of 750 points each
Amplitude resolution	8 bit / 12 bit
Max. number of A-scan samples	16380
Real-time data compression	1 to 2000 ratio
Rectification	FW, HW+, HW–, and RF
Filtering	Digital band-pass, high-pass and low-pass filters
Voltage	PA : 4 V, 9 V, 20 V, 40 V, 80 V, and 115 V UT : 50 V, 100 V, and 190 V
Gain	PA : 80 dB; UT : 120 dB
Pulse width	PA : 30 ns to 500 ns (steps of 2.5 ns) UT : 30 ns to 1000 ns (steps of 2.5 ns)
Bandwidth (-3 dB)	PA : 0.6 MHz to 17.8 MHz UT : 0.25 MHz to 28 MHz
Number of beams	Up to 1024
Pulse repetition frequency (PRF)	Up to 20 kHz
Real-time averaging	PA : 2, 4, 8, 16 UT : 2, 4, 8, 16, 32, 64
Encoder	2 axes (quadrature, clock direction)
Network interface	1000BASE-T
IP rating	IP 65