Rolling Stock Inspection Products and Services

KLDLABS
MEASUREMENT TECHNOLOGIES
An ENSCO Company

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For more than 35 years, KLD Labs, now part of ENSCO Rail, has been at the forefront of railway inspection and measurement technology, providing innovative solutions that elevate the safety, efficiency, and reliability of rail operations worldwide.

Our systems are all designed, developed, manufactured, and supported from KLD Lab's Long Island, New York headquarters, one hour east of New York City. We provide a comprehensive suite of products and services designed to empower railway operators with pertinent and timely information about their rolling stock. Our wayside inspection technologies utilize machine vision, artificial intelligence, specialized image processing techniques, and directed data management to minimize human error, enhance predictive maintenance capabilities, and reduce operational costs.

With KLD Labs, you can expect improvements in fleet safety and performance through precise monitoring and early detection of potential issues. Our solutions are designed to be adaptable, catering to various rail environments, from light rail to heavy haul freight to high-speed trains. And by integrating our systems, you can optimize maintenance schedules, extend the life of your assets, and ensure compliance with the highest safety standards.

ENSCO Rail and KLD Labs take great pride in the long-term working relationships we have with our customers in more than 45 countries. In fact, some of our solutions are still in service after 30 years. In each case, these projects had unique challenges, new measurements, or integration requirements where we worked closely with the customer to deliver a complete digital solution.
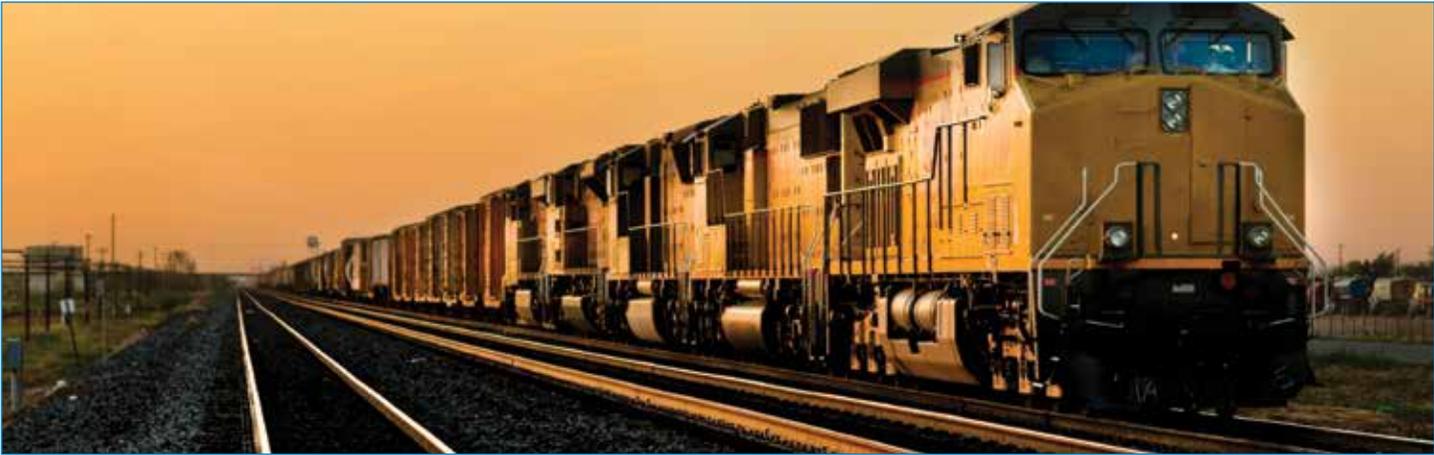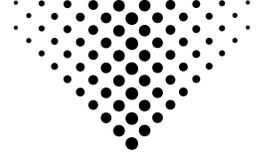
Table of Contents

WheelScan™

The WheelScan™ system by KLD Labs is an advanced in-track wheel profile measurement solution designed to continuously monitor the condition of passenger, freight, and locomotive wheels at track speed. Utilizing the latest imaging and laser technologies, the WheelScan system captures, measures, and stores wear profiles of all wheels passing the measurement site, providing immediate feedback on wheel wear conditions. This real-time data allows for precise maintenance planning and asset optimization, ultimately enhancing safety and efficiency across railway operations.

Comprehensive Measurements and Real-Time Data

WheelScan offers a range of comprehensive measurements, including:

- Wheel profile
- Flange height
- Flange width
- qR (quasi-radial)
- Flange angle
- Rim thickness
- Back-to-back gauge
- Wheel diameter

The system is designed for installation in mainline tracks, marshalling yards, and maintenance workshops, making it adaptable to various railway environments. When integrated with other track-based measurement and detection systems, such as wheel impact and brake monitoring equipment, WheelScan ensures a holistic approach to wheel condition monitoring and maintenance.

Technical Capabilities and Operational Benefits

Employing advanced imaging and laser technology, WheelScan provides accurate, real-time dimensional measurements. This laser-based measurement principle eliminates manual errors, enabling the system to operate at track speeds without disrupting operations. The collected data can be integrated with KLD's TrainBase© application for fleet analysis and reporting, as well as enterprise resource planning (ERP) systems like SAP and Maximo, facilitating comprehensive vehicle evaluation, trending, predictive maintenance, and exception reporting.

Installation and Custom Solutions

The WheelScan system is straightforward to install, requiring only the replacement of a single tie/sleeper without affecting track modulus. It is compatible with railcar AEI tag systems, making it suitable for remote mainline installations. The system's flexibility extends to providing custom machine vision solutions for challenging railway configurations and special requirements, ensuring that each customer receives the most effective tools for their specific needs.

Product Features

Known for its excellence in system performance, reliability, and support, KLD Labs continues to set industry standards. WheelScan offers numerous benefits, such as detecting and measuring hollow tread wheels, identifying wheel sets exceeding wear standards, and collecting data for wheel truing. These capabilities enable precise planned maintenance and budgeting for asset replacement, ensuring long-term operational efficiency.
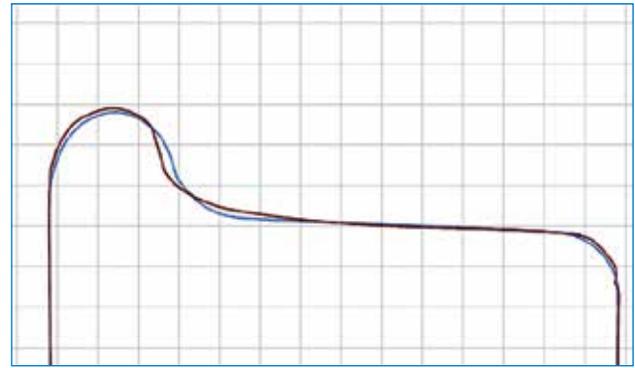
- Detecting and measuring hollow tread wheels
- Identifying wheel sets exceeding wear standards
- Collecting data for wheel truing
- Maintaining a database of wheel measurements and vehicle history
- Enabling wheel/rail interface analysis

Learn how WheelScan can extend the life of your wheels, enhance your fleet's safety and ride quality, and improve your overall maintenance strategy. Experience the benefits of advanced wheel profile measurement technology with KLD Labs' WheelScan system.

TruckScan

KLD Labs' TruckScan System is a wayside monitoring solution that inspects bogie (truck) conditions at track speeds using advanced imaging technology. It can be installed as an add-on or standalone system to automate the inspection of critical truck areas including spring condition, wedge rise limit (friction casting rise), bearing, and end cap. By automatically detecting and flagging rail cars with worn, missing, or asymmetrically placed components, and cross referencing them each vehicle's unique identification number, TruckScan ensures each train's safe running condition. Variations of the TruckScan System are available to identify misaligned axles and missing components.

The TruckScan System is supported by KLD Labs web-enabled TrainBase© data management application for comprehensive vehicle evaluation, trending, predictive maintenance, and exception reporting. The system is also compatible with enterprise resource planning (ERP) asset management systems such as SAP and Maximo.

Key features include:

- Automatic detection and analysis of bogie components
- Suspension issues and vehicle asymmetry detection
- Web-accessible database for analysis and reporting
- Full integration with automatic vehicle identification
- Predictive maintenance capabilities
- Elimination of manual inspections and user-to-user variability
- Installation options for yard, shop, and mainline
- 24/7 data collection
- Speed-independent operation

BrakeScan

KLD Labs provides advanced automated wayside equipment to assess the wear on brake shoes, pads, and discs, along with portable tools for brake disc evaluation.

Automated Brake Inspection

The BrakeScan system automates brake inspections, providing instant feedback on brake wear as each vehicle, car, or wagon passes through the wayside measurement system. Using advanced imaging technology, BrakeScan captures high-resolution brake profile images and performs real-time dimensional measurements. It is compatible with various brake types, including brake shoes and axle-mounted, wheel-mounted, and outboard-mounted disc brakes for both freight and passenger rail.

The system can be integrated with other wayside detectors, such as those for wheel profiles, wheel impact, and hot wheels, as well as other vehicle inspection systems. All BrakeScan measurements and vehicle identification data are stored in KLD's web-enabled TrainBase© application for detailed analysis, trend tracking, and exception reporting.
The BrakeScan system accurately identifies disc brake sets that exceed wear standards and collects brake profile data for resurfacing or replacement.

Key features include:

- Elimination of manual measurements
- Web-accessible database, analysis, and reporting tools
- Compatibility with all asset management systems
- 24/7 operation at track speed
- Installation options for yard, shop, and mainline
- Optional measurements for pilot and door height
- Continuous brake wear measurement and analysis for brake shoes, pads, and rotors

Portable Brake Assessment

For portable brake assessments, the MiniProf BT Brake instrument is a user-friendly, lightweight, wireless tool that monitors the cross-sectional profiles of brake discs. It attaches magnetically to the brake rotor, and is compatible with various brake types, including cheek and axle-mounted designs. The MiniProf BT is supported by the Envision software suite which enables measurement, storage, and analysis of results. Ruggedized notebooks and tablets pre-loaded with Envision software are also available.

UnderScan

KLD Labs' UnderScan is a cutting-edge machine vision technology purpose-built for high-speed assessments, UnderScan leverages advanced artificial intelligence (AI) and machine learning (ML) algorithms to automate the detection of anomalies and defects across various rolling stock components. The state-of-the-art imaging system captures ultra-high-resolution images of critical undercarriage components, including couplers, axles, air hoses, brake mechanisms, and other underbody parts. These detailed virtual assessments significantly enhance rail safety and operational efficiency by enabling maintenance teams to quickly and accurately identify issues, prioritize repairs, and minimize downtime.
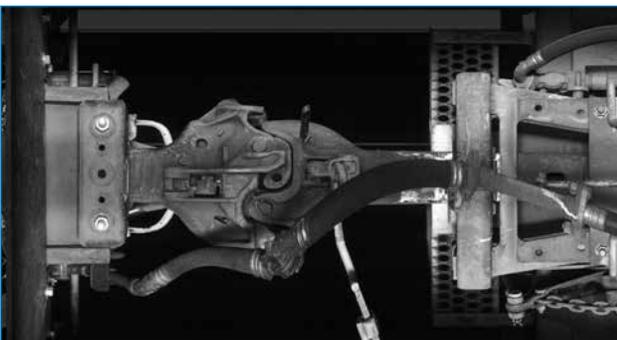

Key features include:

- **Condition Assessment:** Inspects at operational speeds, minimizing service disruptions and preserving rail network integrity.
- **Automated Anomaly Detection:** Uses AI/ML to detect defects, missing components, and cracks for reliable maintenance.
- **High-Resolution Imaging:** Provides detailed visuals for accurate virtual assessments and informed maintenance decisions.
- **Seamless Integration:** Compatible with AEI tag systems and other wayside technologies for a comprehensive maintenance solution.

UnderScan Automated Rail Vehicle Inspection

UnderScan is a robust, track-based machine vision system for automated rail vehicle inspection. It integrates object illumination, line scan cameras, and environmental controls within a durable, in-track enclosure, ensuring reliable performance in modern rail operations. Leveraging AI/ML technologies, UnderScan improves inspection efficiency while maintaining high safety standards. Its modular design, with control electronics and user-friendly software, allows seamless operation and easy integration into existing rail infrastructure.

SillScan
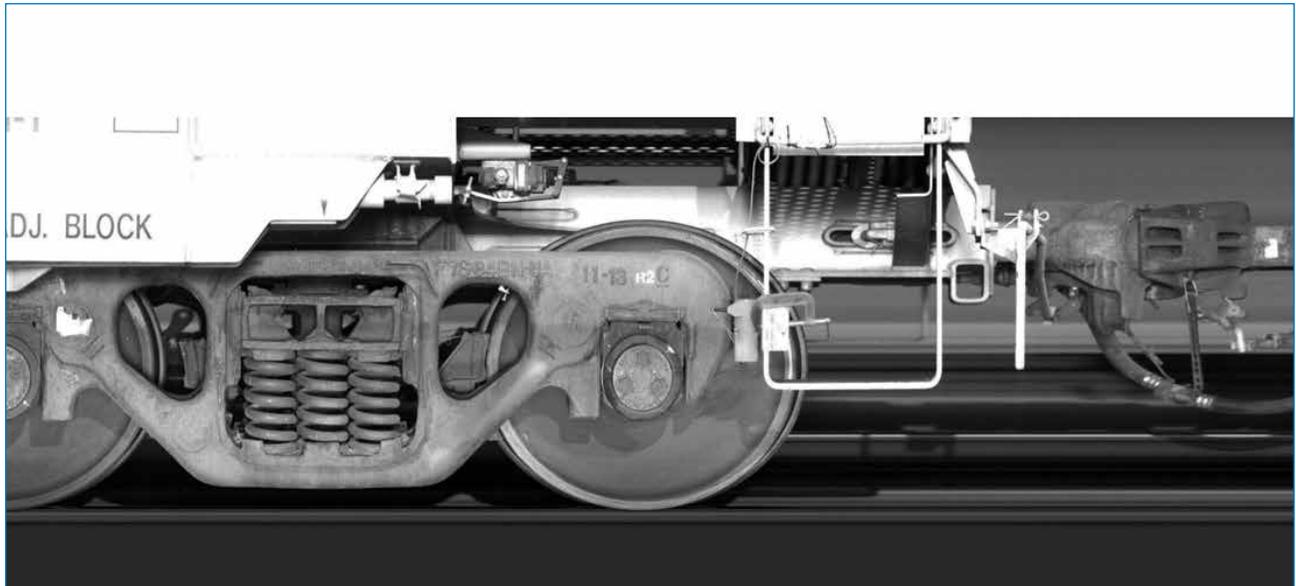
With its state-of-the-art inspection system, SillScan produces high-resolution images of the underfloor side-views of rolling stock, allowing rail operators to:

- **Identify Potential Issues Early:** Detect wear and tear, damage, and misalignments before they become costly problems.
- **Improve Maintenance Efficiency:** Streamline inspection processes with automated, high-precision imaging, reducing downtime and increasing operational efficiency.
- **Enhance Safety Compliance:** Ensure your fleet meets safety standards with consistent, reliable inspections.

Whether you're managing freight, passenger, or mixed-use rail systems, KLDLabs' SillScan offers unparalleled insights into your fleet's condition.

SillScan allows for side views of key underfloor equipment such as:

- Air Hoses
- Couplers and Draft Sills
- Bogie Components
- Brake Rigging
- Underfloor Mounted Equipment
- Door Height

MiniProf BT Wheel

KLD Labs offers both automated and portable measurement tools for assessing wheel profiles and wheel wear conditions, as well as tools for condition-based maintenance planning and execution. While WheelScan™ is the automated solution, MiniProf BT Wheel is the portable version designed for quick and accurate wheel profile measurements.

MiniProf BT Wheel Overview

KLD Labs is the North American representative for the entire line of MiniProf instruments. The MiniProf BT Wheel instrument is an easy-to-use, lightweight, hand-held wireless tool for accurately monitoring cross-sectional profiles of the wheel. It attaches magnetically to the backside of the flange, and measurements take about five seconds to complete. The instrument can be used on many different wheel types, ranging from trams to locomotives. KLD Labs can provide a fully tested ruggedized notebook or tablet PC pre-loaded with the MiniProf BT Envision software, as well as a ruggedized Android phone pre-loaded with the MiniProf BT Android's Criterion software or customers can use their own devices.

Key features include:

- **Instant Results**: Wear parameters such as Sd, Sh, and qR values are displayed instantly after each measurement in real-time view. Numerous additional calculations and alignments are included in the powerful Envision software for basic to advanced data handling, analyzing, and reporting.

- **Reprofiling:** The MiniProf BT Wheel system is ideal for use before and after reprofiling of the wheels to determine when to reprofile and how much material to remove during the reprofiling process. This leads to precise reprofiling and improved lifetime of the rolling stock due to the unmatched high accuracy of the MiniProf system.
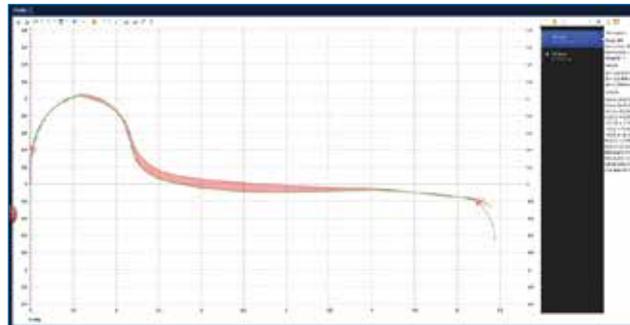

Versatile Applications

For improved diameter measuring, the MiniProf Wheel 400 is equipped with a wide 400 mm backplate, making it the best option for profile and diameter readings in one single measurement. The MiniProf Wheel, with its compact and lightweight design, is a versatile tool for measuring most types of wheels, even in limited measuring spaces.

The accurate and reliable MiniProf systems and Envision software are used by thousands of global users for investigating wheel-rail interface issues, reprofiling, grinding, prediction/optimization of asset life, quality control, friction, lubrication strategies, and much more.

TrainBase©
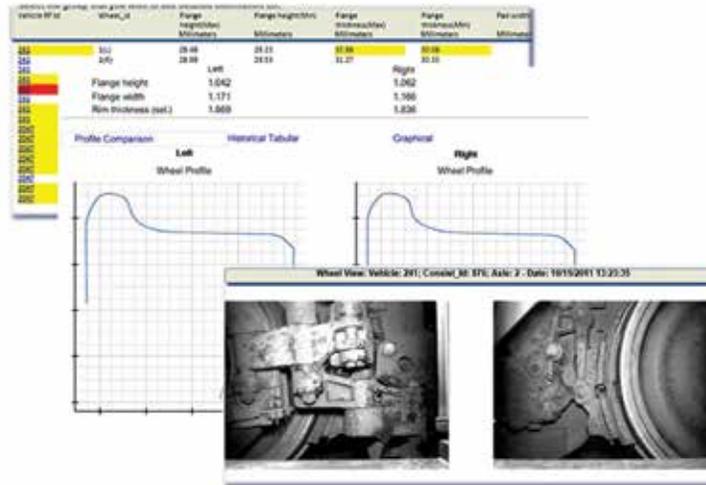
TrainBase© is a comprehensive cloud-based Big Data management and analysis platform designed to provide unparalleled insights into fleet and individual vehicle conditions. It offers a versatile database, analysis, reporting, and alerting tools that can be hosted either in the cloud or locally. The system utilizes an MS SQL scalable backend, ensuring robust performance and scalability. TrainBase delivers detailed tabular, statistical, graphical, trending, and predictive maintenance reporting, making it a critical tool for effective fleet management. Additionally, it seamlessly exports data to the rail industry's EAM/CMMS software and other third-party applications, enabling efficient integration and utilization of collected data.
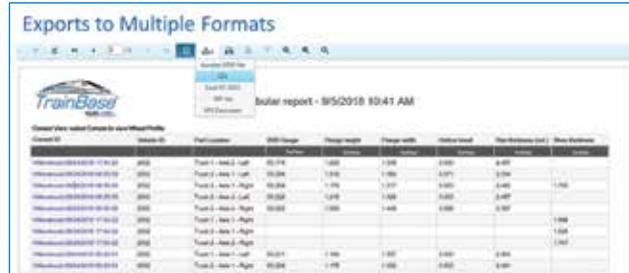
Key features include:

- Cloud-based or locally hosted database, analysis, reporting and alerting tools
- MS SQL scalable backend
- Fleet and individual vehicle condition
- Tabular, statistical, graphical, trending and predictive maintenance reporting
- Exports data to rail industry's EAM/CMMS software and other 3rd Party applications
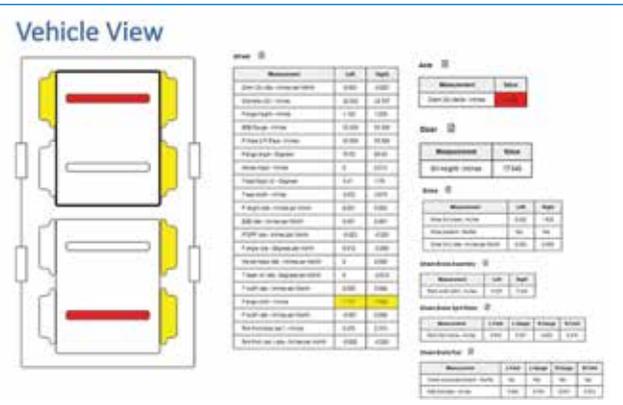
Visit Our Website

55 Cabot Court
Hauppauge, NY 11788
(631) 549-4222
info@kldlabs.com
Visit us at kldlabs.com