GD REAL TESTING

GD Real Testing focuses on the research and development and promotion of track maintenance equipment, providing digital and intelligent products as well as services for railway and subway operators.

Our Mission

GD Real Testing adheres to the principle of "**understanding the world through data, empowering the world with data**" and the mission of " **Enhancing traffic safety**“

Main Business

GD Real Testing's main products and services are **Ground penetrating radar detection system**, **3D Laser scanning system**, **Rail flaw detection system**, and **related detection services**. Additionally, **customised track comprehensive inspection system solutions is also available**.

CONTENTS

GD Real Testing

1 Ground Penetrating Radar Detection System

2 3D Laser Scanning System

3 Ultrasonic Rail Flaw Detection

4 Dual-use intelligent comprehensive inspection vehicle

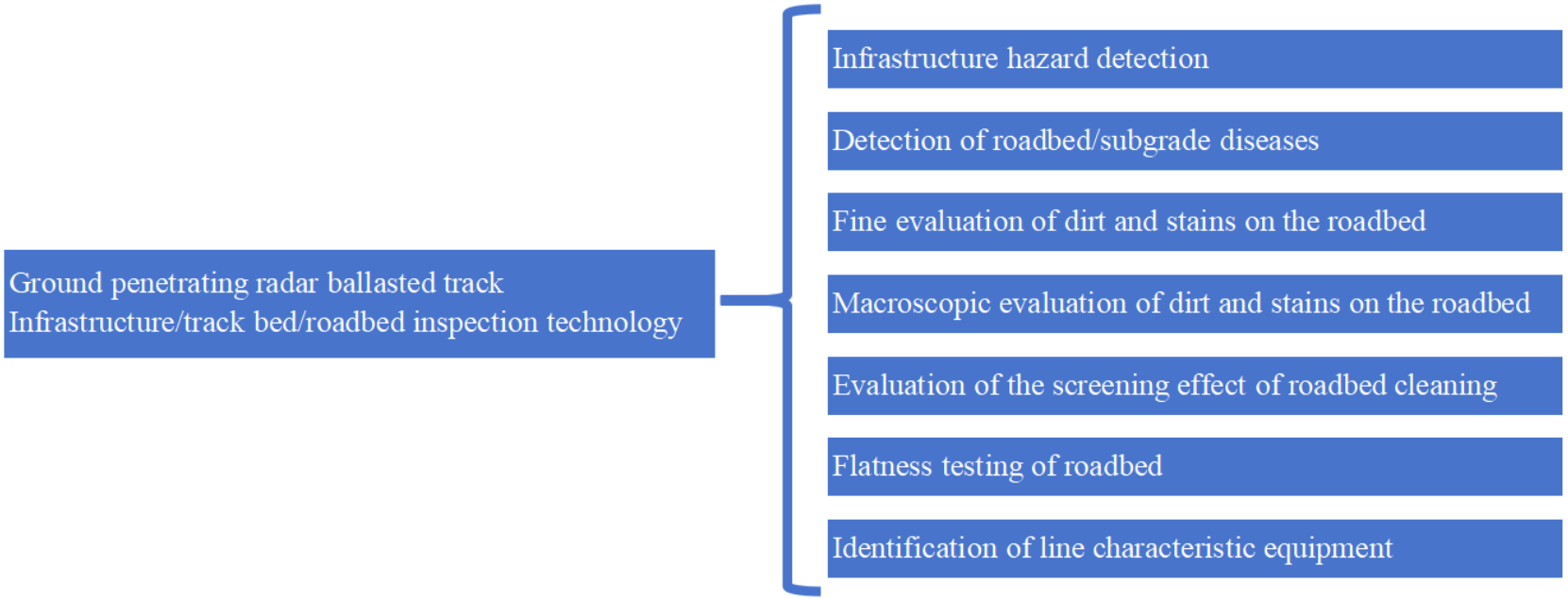
5 Adhesive Insulation Joint

6 Anti-Loose Washer

7 Related Detection Services

Ground Penetrating Radar Detection System

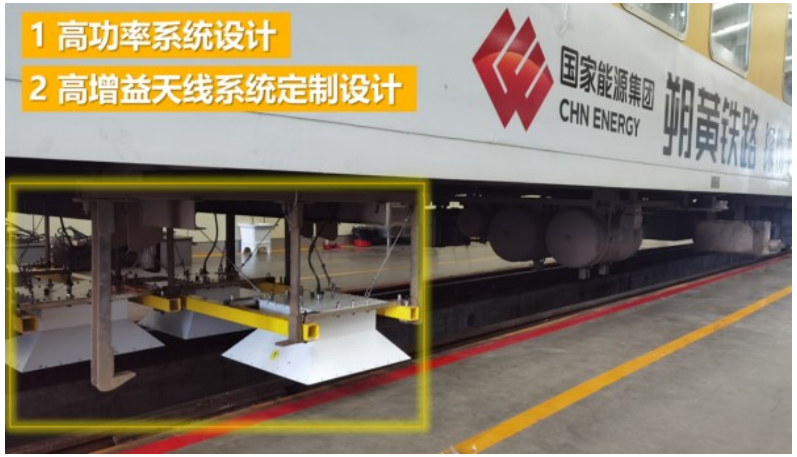
- **System Introduction**



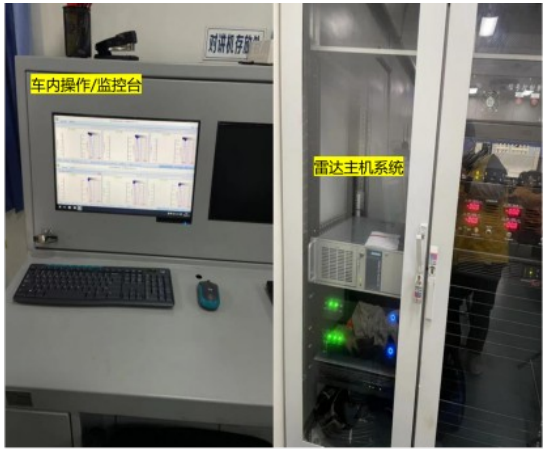
Tunnel Infrastructure Risks: Identify and locate deep crushing, water-rich areas, voids and fractures, subsidence and uncompaction of the infrastructure, etc;
Subgrade defects: subgrade voids, settlement, fragmentation, water rich areas, etc;
Ballast bed contamination: ballast bed contaminants distribution, areas rich in water, slurry boiling, mud overflow, evaluation of large machine cleaning effectiveness, detection of ballast deficiency, etc;

- **Test Case**

The comprehensive inspection of in the Shuohuang heavy-haul railway of China National Energy Group



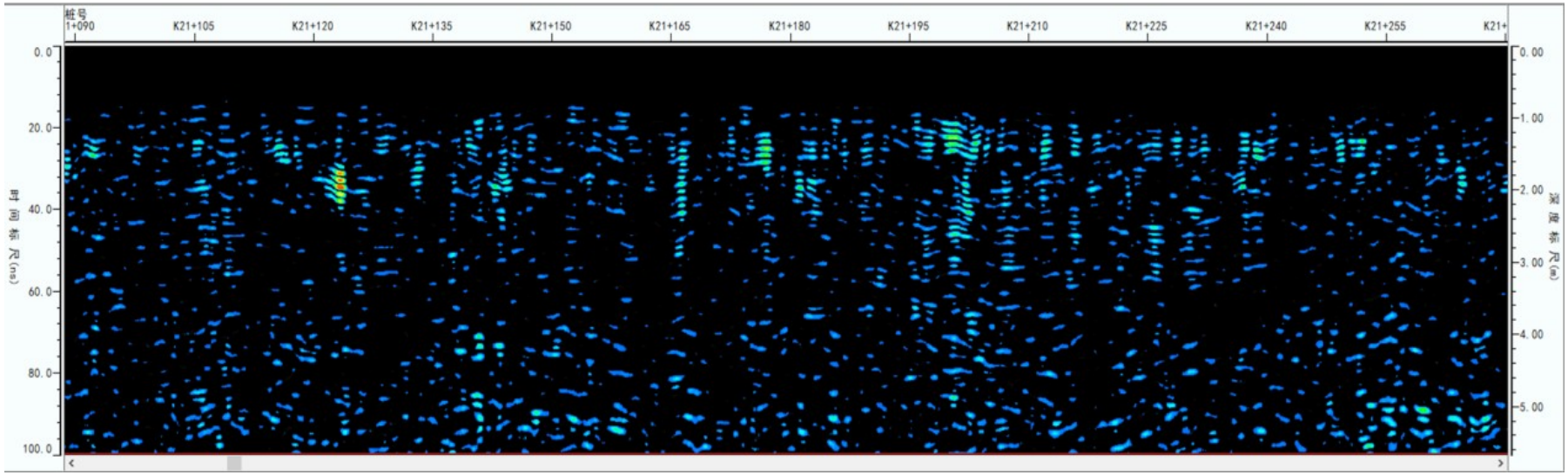
China Railway Shanghai Bureau Railway ballast bed contamination and subgrade defects detection



- **Results Display**

Tunnel subgrade inspection

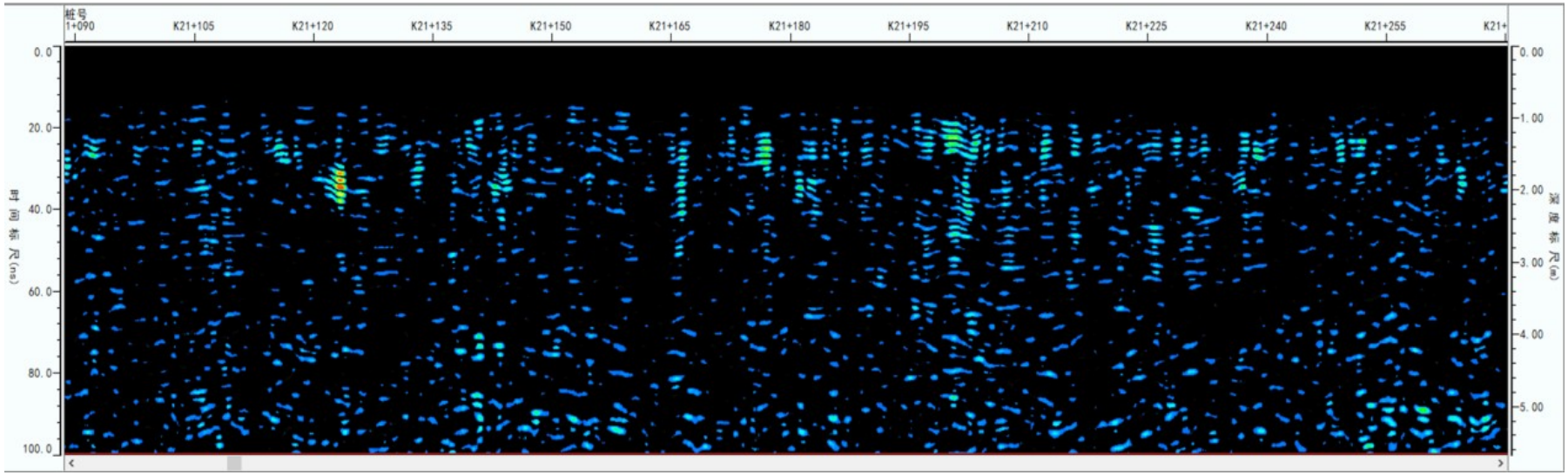
- Radar map of tunnel basement in good condition



- **Results Display**

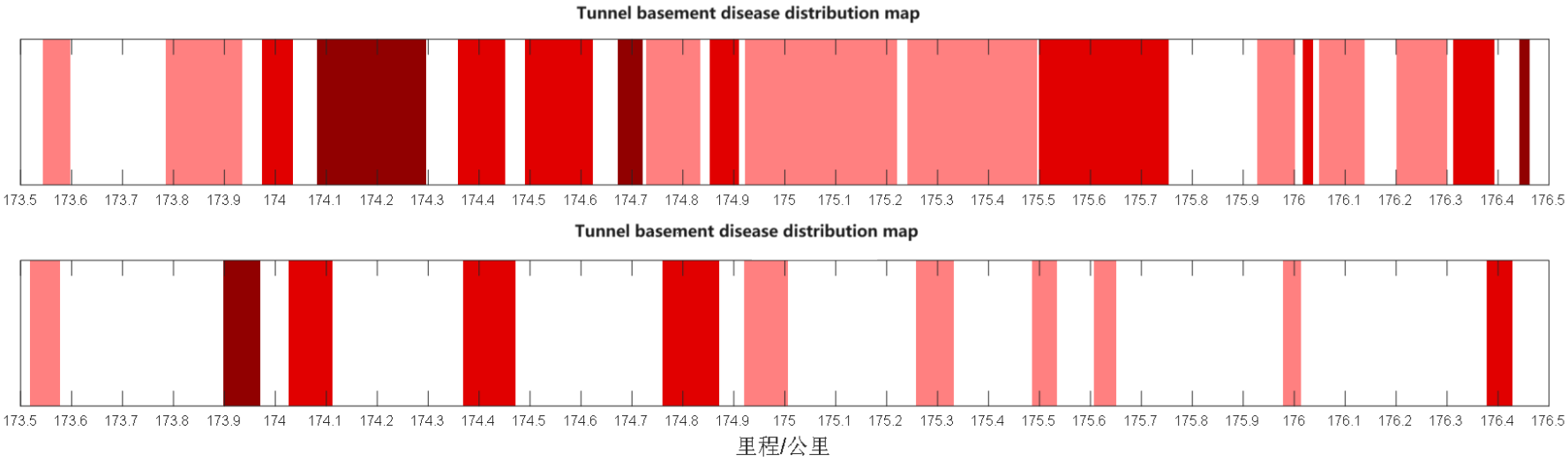
Tunnel subgrade inspection

- Radar map of tunnel basement in good condition



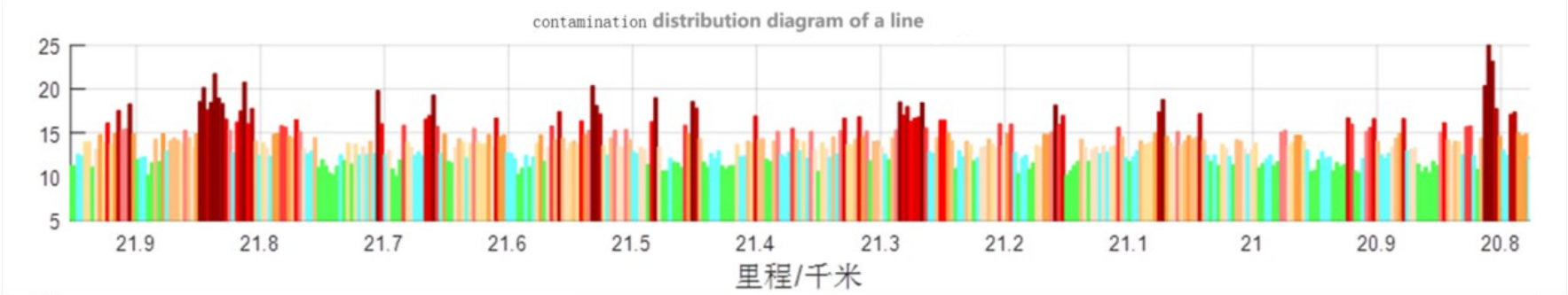
- **Results Display**

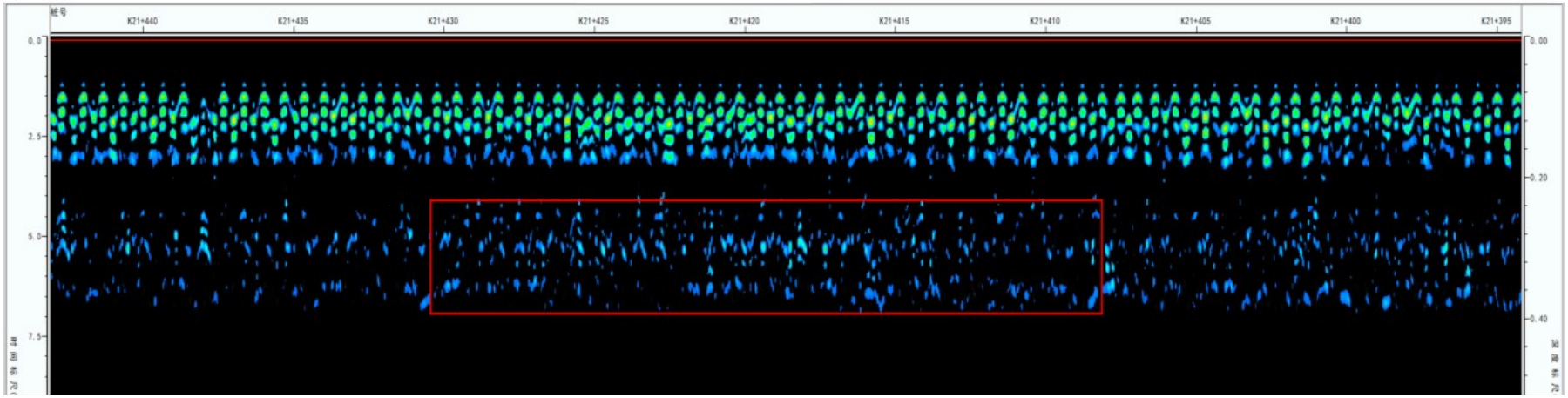
Tunnel subgrade inspection



- **Results Display**

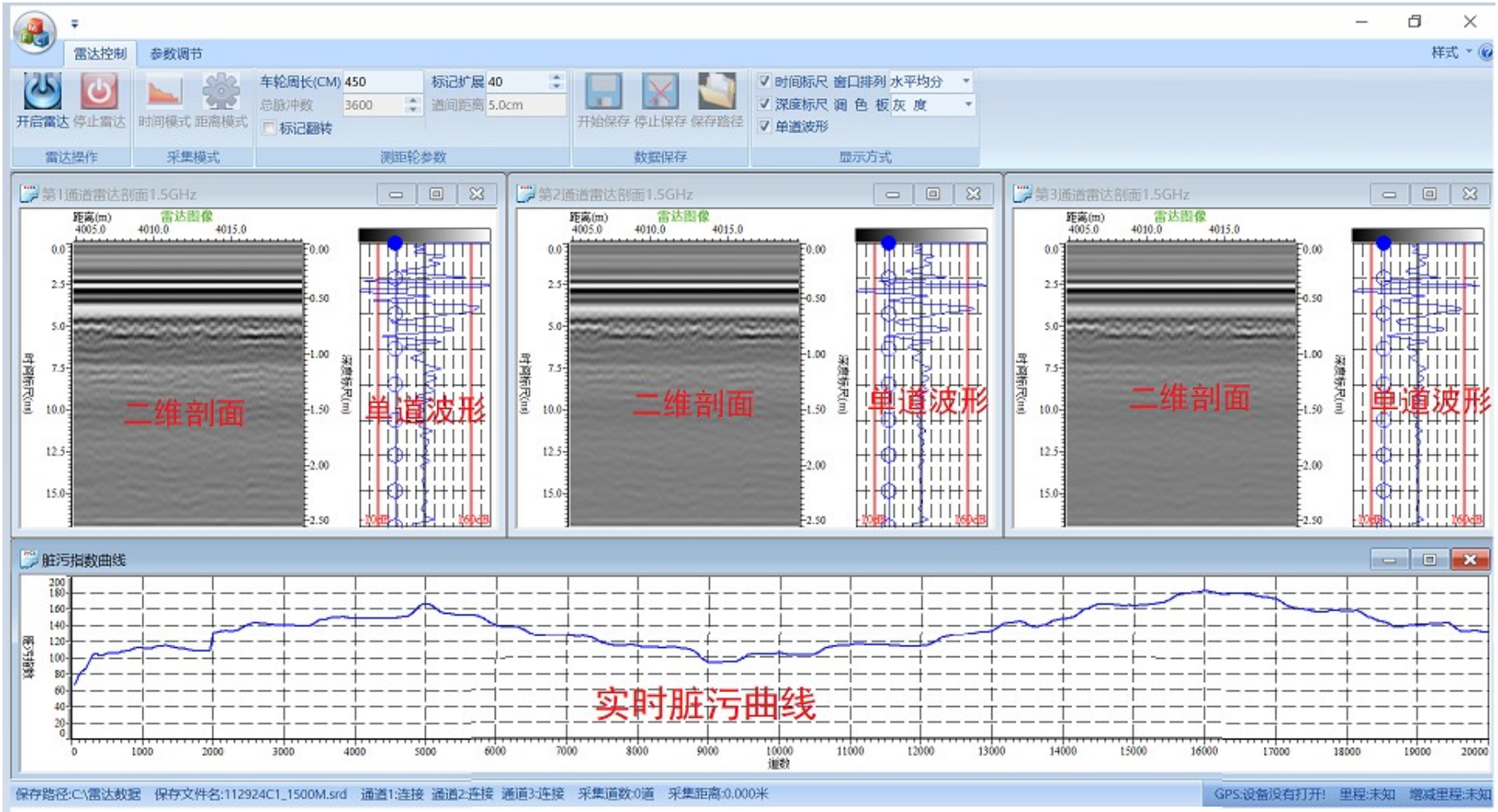
Distribution of contamination on the subgrade





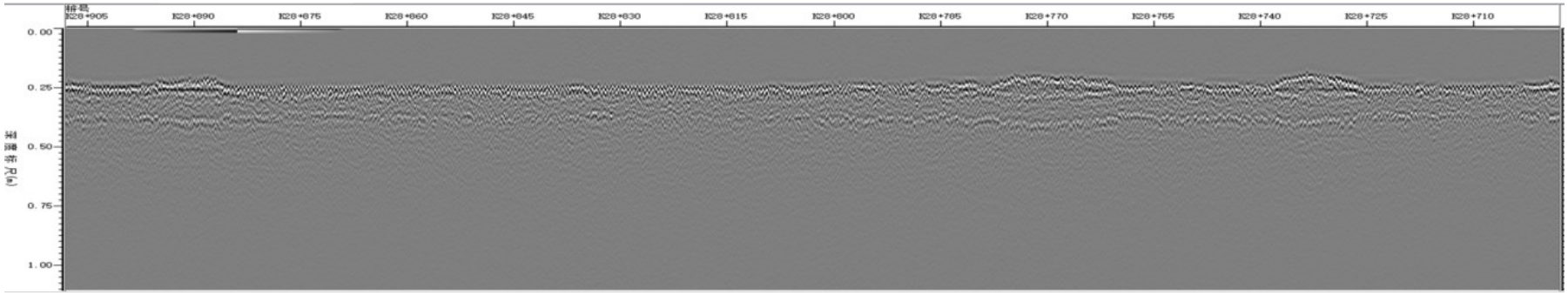
- **Results Display**

Real time contamination curve output



- **Results Display**

Excavation verification(Sand content in subgrade)

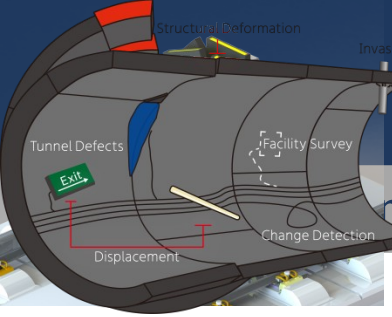


- **Advantages**

Through long-term cooperation with **Shuohuang Company** and **the Shanghai Railway Bureau**, a **substantial experimental data bank** has been established. Based on **excavation verification**, **size calibration**, and experiments on the **dielectric constant of contaminated track beds**, GD Real Testing Company has achieved significant results in the **quantitative detection** of track bed contamination and algorithm research on track bed contamination. These achievements can be summarized as follows:

1. **A quantitative evaluation system based on radar detection of track bed fouling rates**;
2. **An assistance decision-making and screening quality evaluation system**;
3. **Customized development of integrated ground-penetrating radar detection equipment for heavy-haul railway track bed/subgrade/foundation structures**;
4. **The first implementation of "condition-based repair" guided by detection data for screening construction, leading to significant savings in staff costs**.

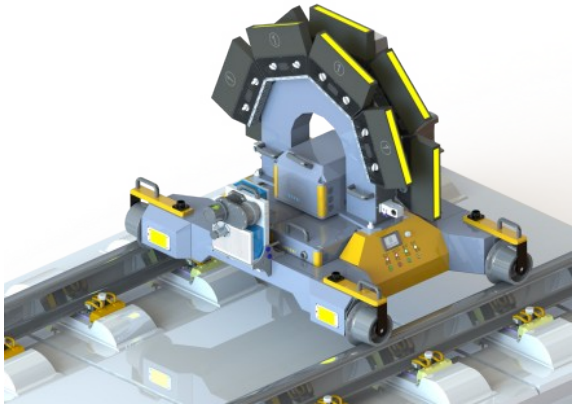
3D Laser scanning system



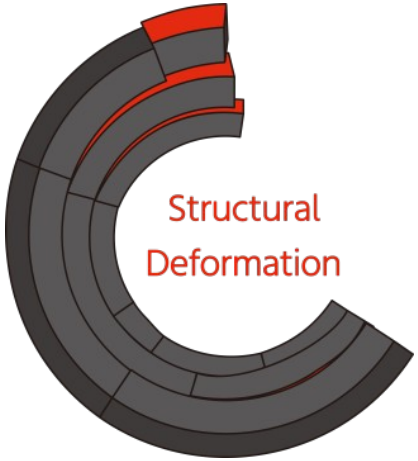
Scanning System

GD Real Testing

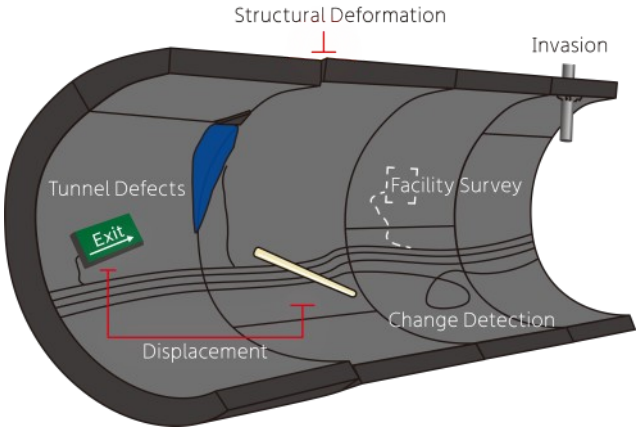
ntroduction



Electric railway vehicle



Structural Deformation



Tunnel Defect + BIM Model

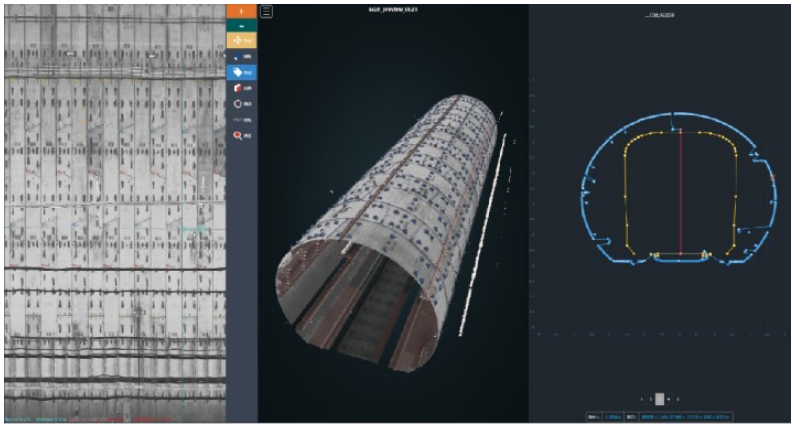
Tlsd **mobile laser scan system** is designed for railway tunnel inspection and **digital twin**. Outcomes include **tunnel structural deformation**, **defect inspection**, **clearance measurement**, **BIM/Mesh model**, **facility survey**, etc. The system can be mounted on railway vehicle, enabling you to gather **lidar data and HD images** in one way efficiently.

3D Laser Scanning System

GD Real Testing

- **Results Display**

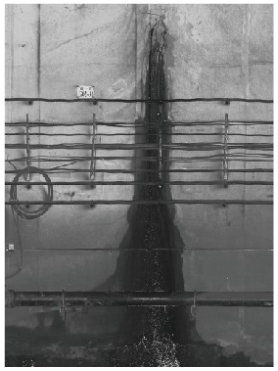
Tunnel Structural Deformation

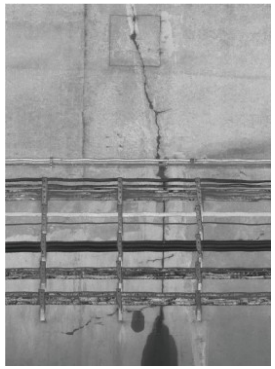


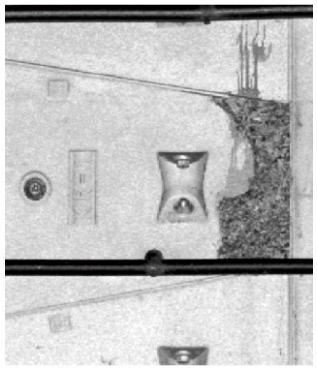
- Lidar intensity/depth image
- Circlular convergence and segment dislocation
- Clearance
- Multi-period changes
- CAD drawing,excel sheet,thematic image,etc

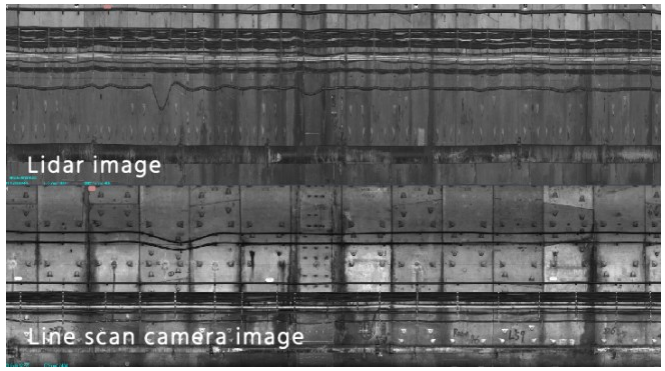
Defect Inspection

- Image resolution up to 0.2mm/pixel
- Tunnel defects, facilities and changes inspection
- Multi-view analysis: lidar image, map, HO image, GPR image,cross-section drawing









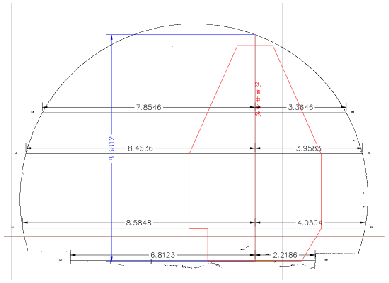
3D Laser Scanning System

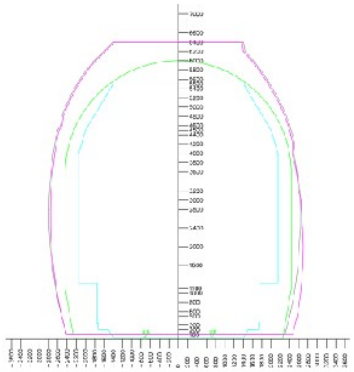
GD Real Testing

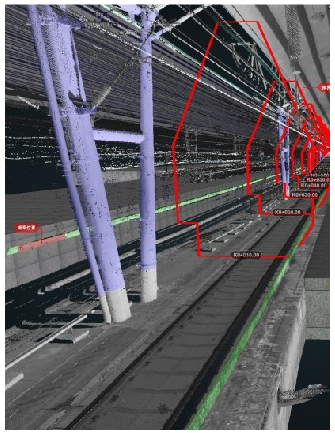
- **Results Display**

Clearance Gauge

- Cross-section CAD drawing & Excel report
- User-defined vehicle, profile, gauge, .dxf template
- Clearance gauge report

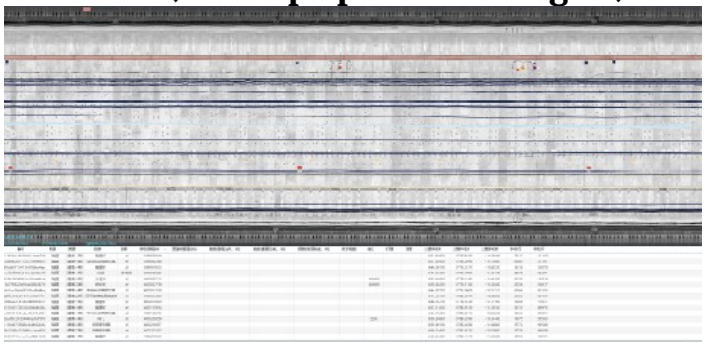




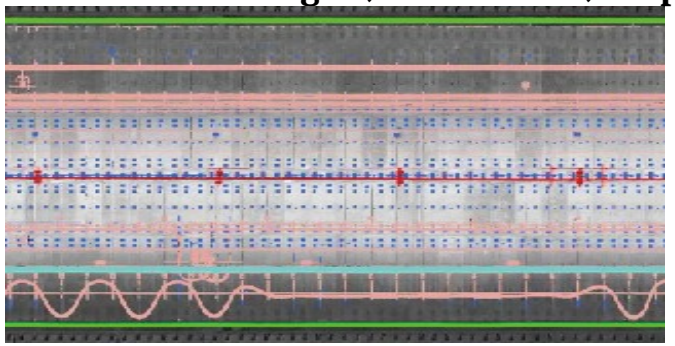


Al lmage Recognition

- Utilizing data classification method and AI recognition algorithm
- Metro Shield Tunnel Feature Recognition
- Recognition rate (≥90%)
- Bolt、 Segment、 OCS、 Cable Signboard、 Track bed、 Fastener、 Escape platform Target、 Rail track、 Pipe



Bolt、 Segment、 OCS、 Cable Signboard、 Track bed、 Fastener、 Escape platform Target、 Rail track、 Pipe



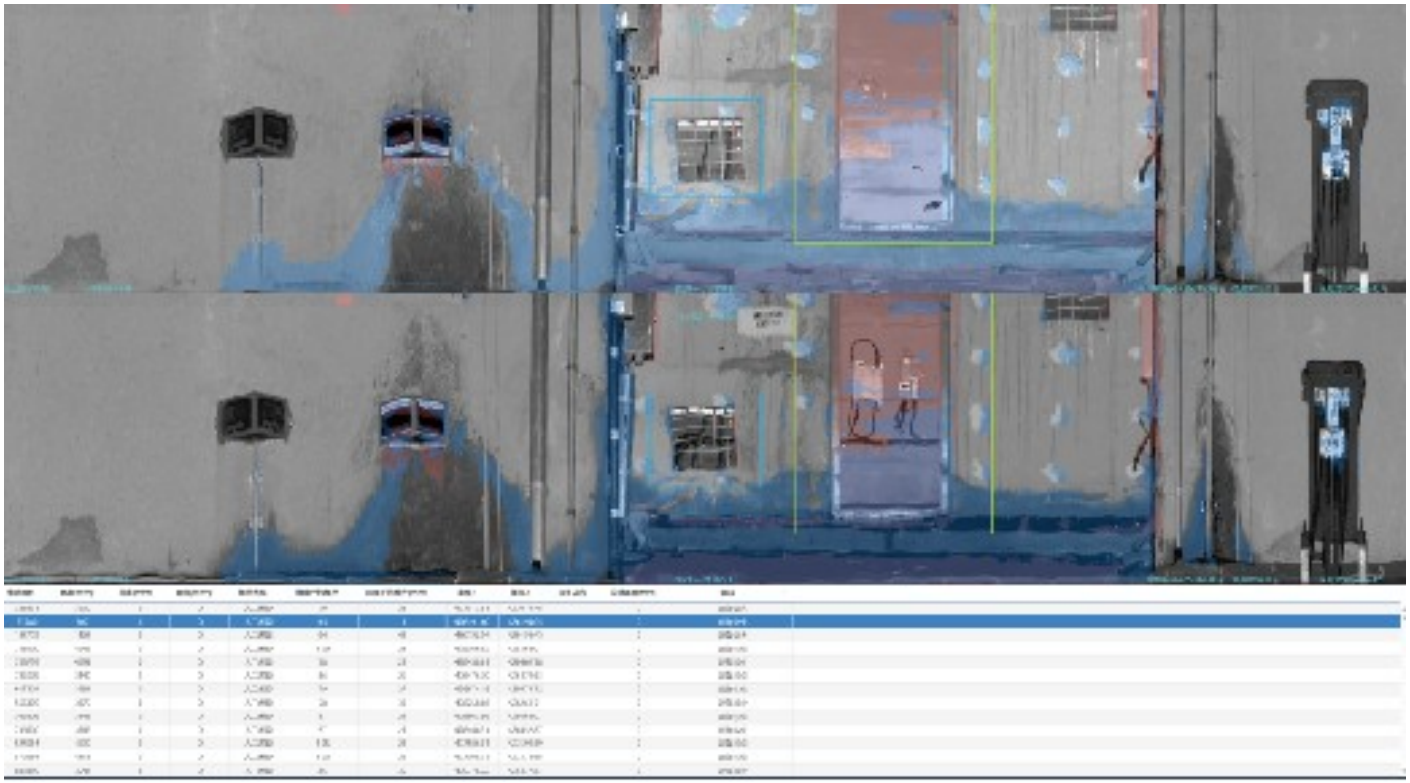
3D Laser Scanning System

GD Real Testing

- **Results Display**

Change Detection

- **Multi-period comparison based on coordinate and laser intensity**
- **High light and vectorization of water leakage, cable displacement and facility changes**
- **1 cm×1 cm identifiable at 1.8 km/h with Z+F 9012 scanner**

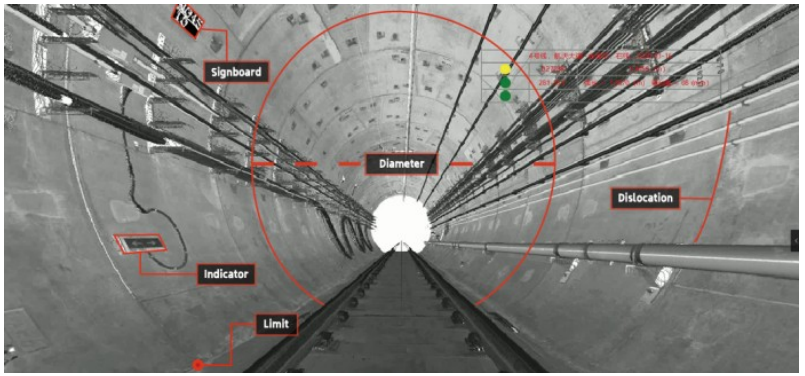


- **Results Display**

Digital Twin

Roaming Video

- MultiView Rendering Video(Perspective/Front/Otho,etc)
- Data integration: deformation, clearance, defects and facilities etc



Feature & Model

- Interactive and AI-aided feature extraction
- Revit model: tunnel, track, catenary, evacuation route, communication device box, fire pipeline, etc.
- OsGB model, etc.

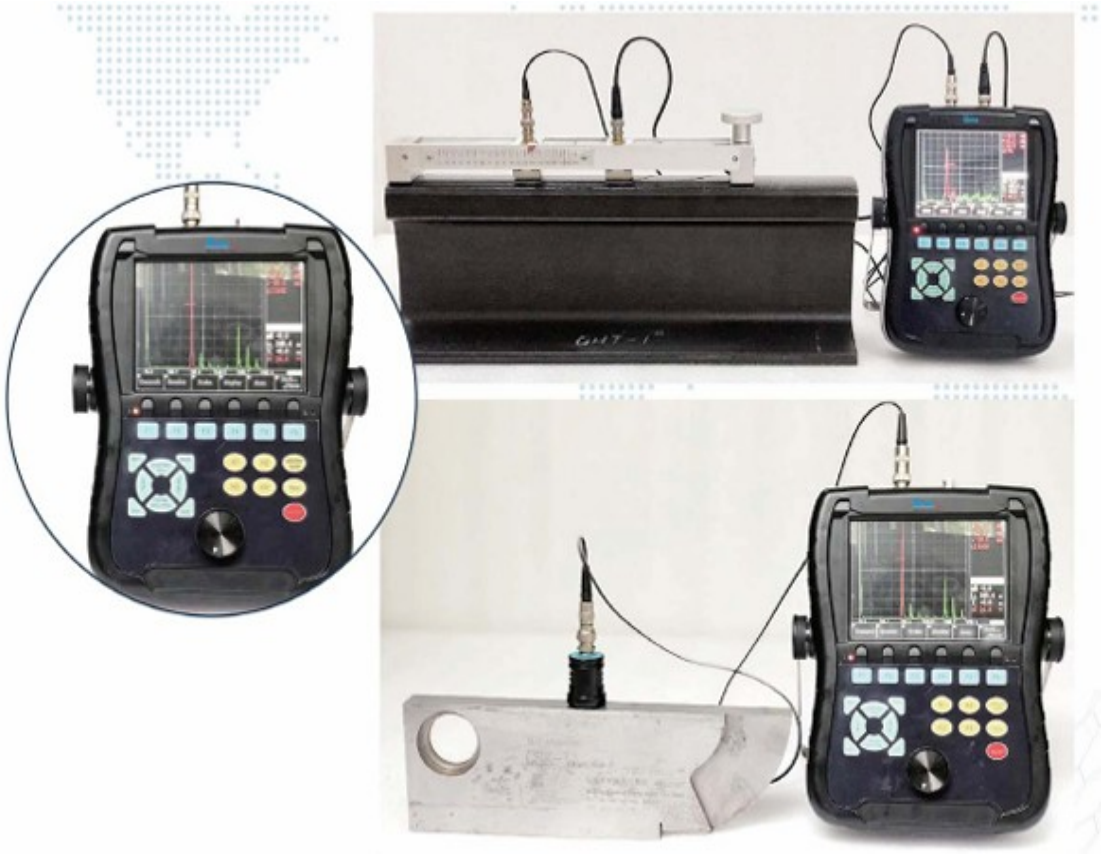
Ultrasonic Rail Flaw Detection

Ultrasonic Rail Flaw Detection

GD Real Testing

- **CK2108 Ultrasonic Flaw Detector**

CK2108 ultrasonic flaw detector adopt industrial advanced square wave excitation technology, which has stable performance,light and portable,convenient operation and high price-to-cost rate.The display screen adopts high-resolution ratio TFT screen (640*480),which is fully competent to work outdoors and in direct sunlight; High-performance lithium battery, the continuous working time can reach 8 ~11 hoursand the weight is only 1.5kg, so it is suitable for non-destructive testing in railway transportation departments.



Ultrasonic Rail Flaw Detection

GD Real Testing

- **RTS18-B Dual Rail Hand push Ultrasonic Flaw Detector**

9 channel Roller Search Unit(wheel probe)

High Brightness Rugged Tablet Display

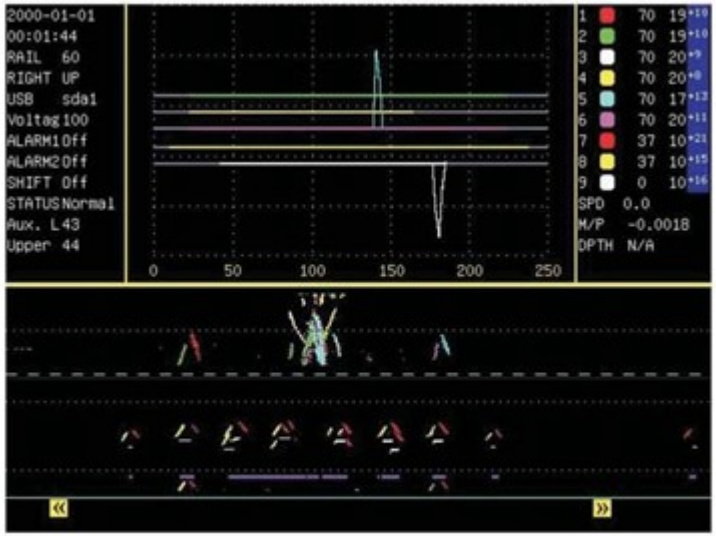
The trolley can be easily assembled and disassembled. Each part is no more than 10kg, the weight of the whole trolley is less than 45kg. The assembly time is less than 3 minutes.

Ultrasonic Rail Flaw Detection

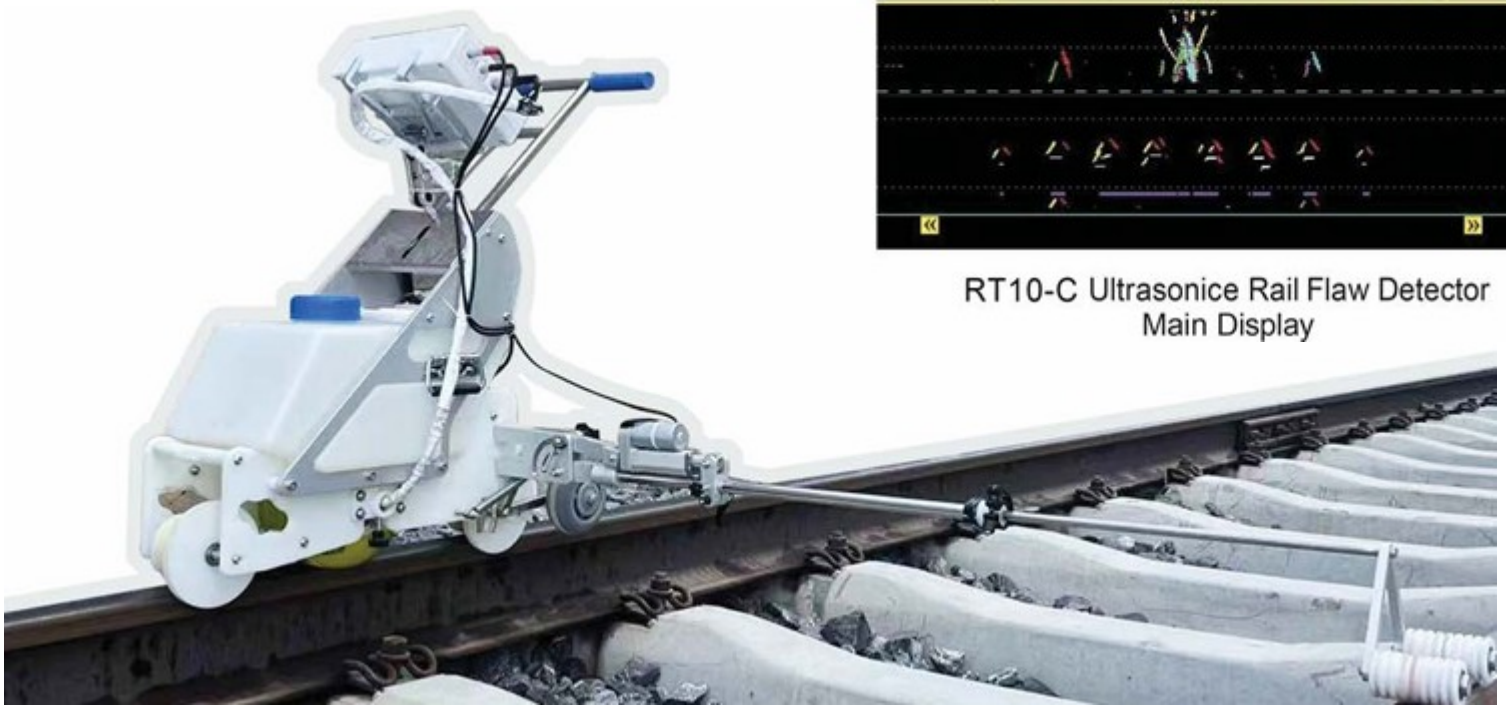
GD Real Testing

- **RT10-C Ultrasonic Rail Flaw Detector**

RT10-C is our upgraded version of RT10-B ultrasonic rail flaw detector. The most distinguished feature is RT10-C instrument offers simultaneous A-scan and B-scan.



RT10-C Ultrasonice Rail Flaw Detector Main Display



Ultrasonic Rail Flaw Detection

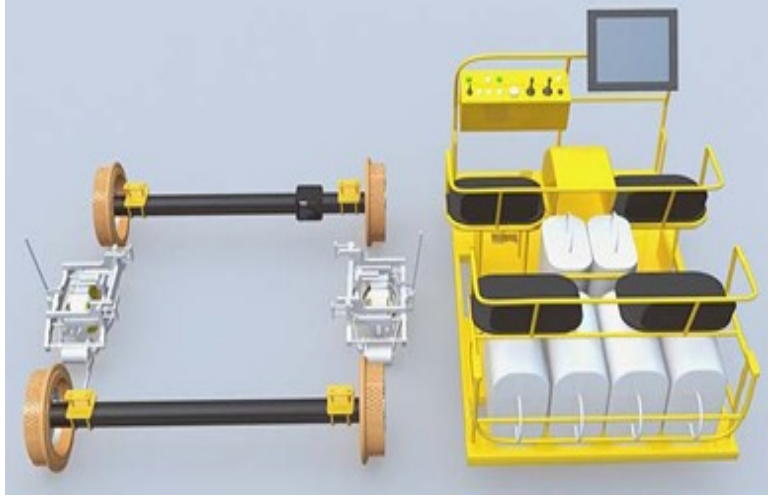
GD Real Testing

- **UR18-D Ultrasonic Rail Flaw Detection Electrical Vehicle**

UR18-D Ultrasonic Rail Flaw Detection vehicle adopts ultrasonic wheel probe technology, with two 9 channels ultrasonic wheel probes. Data from total 18channels of two rails are displayed on the military grade high-intensity rugged Laptop in the form of B-scan.

UR18-D Ultrasonic Rail Flaw Detection vehicle can effectively detect the flaws at the rail head, bolt hole breaks and transverse defect at rail base. The detection rate can be up to more than 95%. The detection vehicle equips with a smart defect recognition system for automatically pop-up a zoomed window with view of the alarm section which is convenient for the operator to make decision in real time, The vehicle frame is made of Titanium alloy with patented split design, each part is less than 60kg.

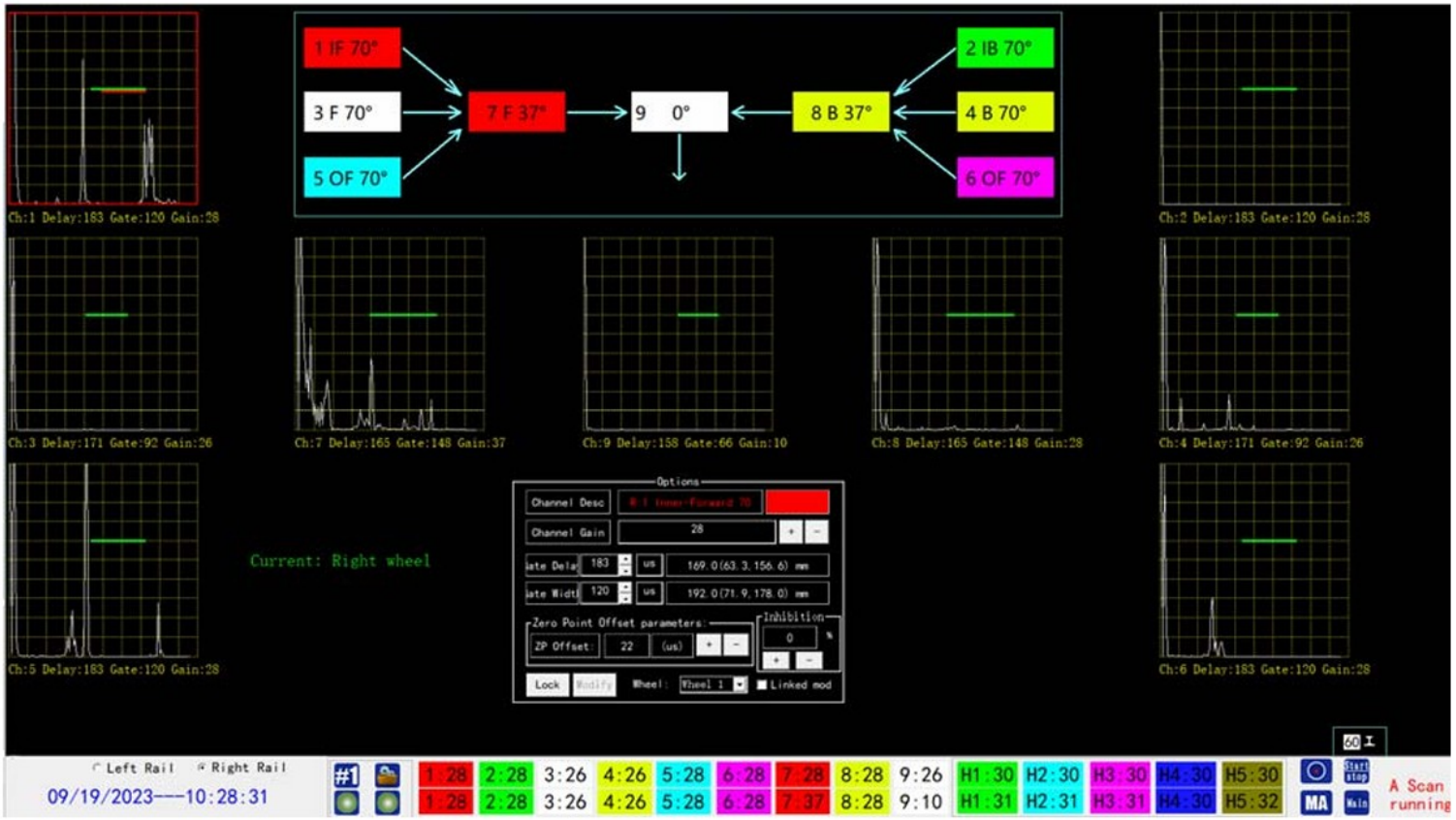
Titanium alloy maintains great strength while decreasing the weight. The vehicle uses lithium battery for environmental protection and can test with a detection speed of 15 kilo meters per hour. This ultrasonic rail flaw detection vehicle can work in very worse environment 30C~45C(-220F~113F)



• Results Display

A-Scan

The following is a typical A-scan picture on the test screen. It shows the A-scan waveforms of all 9 channels of right rail.



• Results Display

B-Scan

The following is a typical B-scan picture on the test screen.

• Results Display

Replay Software

All the information recorded during the test can be replayed. The following is a typical data replay on the screen.

Ultrasonic Rail Flaw Detection

GD Real Testing

- **GT6600 Hi-Rail Ultrasonic Rail Flaw Detection Vehicle**

Channels: total 26 channels, 13 channels on each rail. In each rail, there are SIX straight 70 degree channels (forward and backward), FOUR skewed 70 degree channels (gauge skewed and field skewed, forward and backward), TWO 37 degree channle, ONE 0 degree channel.

• Results Display

Sample B-scan Image

Ultrasonic Rail Flaw Detection

GD Real Testing

- **RTI RFDV'S**

RTI's RFDV Vehicles test at high Speed.

RTI's RFDV's are all accredited to AS/RISSB 7502:2016 Road Rail Vehicle standard.

Additional client HiRail requirements can be accommodated.

RTI's testing methodologies include:

- Single Vehicle Stop and Confirm, defects verified within minutes
- Chase Vehicle (various modes of defect confirmation depending if the Chase Vehicle is on or off-track). Suspect are located by odometer and high accuracy differential GPS (less than 0.5m).
- Test Through/Non- Stop testing with Hunter Post Analysis

RTI RFDV'S

GD Real Testing

• 8800SX System

When the RTI 8000SX system was introduced in 1998 it was considered the highest resolution system in the industry with 1,024 samples per frame.

Today, the RTI 8800SX system collects 65,536 samples per frame. This provides sufficient head room so as not to saturate any signals and thus, achieve accurate automated defect recognition and sizing.

The 8800SX Automated Rail Flaw Detection System was released in 2016. The electronics and racking hardware accommodates the 8800SX Ultrasonics and provisions for RTI's Optional SurfaceMap System, Video Cameras and other optional technologies. The sub-rack allows for up to 80 ultrasonic channels.

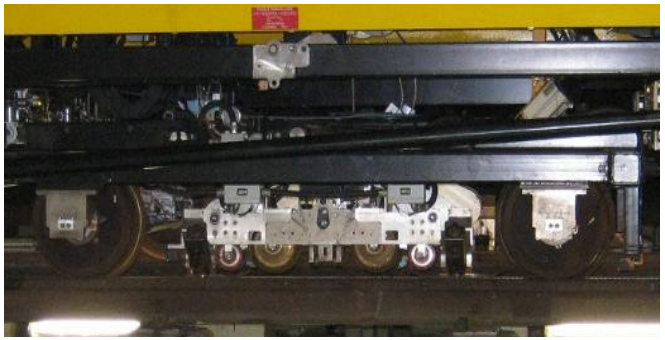
The 8800SX architecture allows for Real Time channel-to-channel, frame-on-frame correlation of linear and phased array transducer capability utilising a high speed bus.

RTI RFDV'S

GD Real Testing

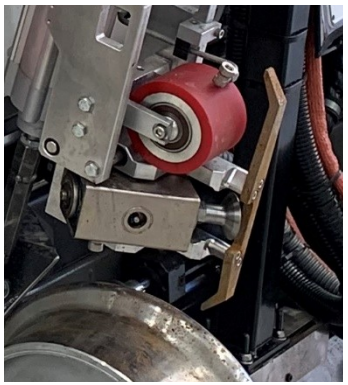
- **Smart Track Test Carriage with Roller Search Units / Probe Wheel**

Smart Track Test Carriage on a 4WD Hi Rail



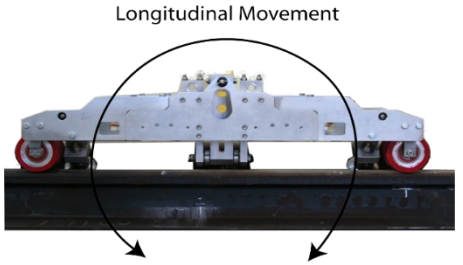
Smart Track Test Carriage within trolley for Rail bound vehicles

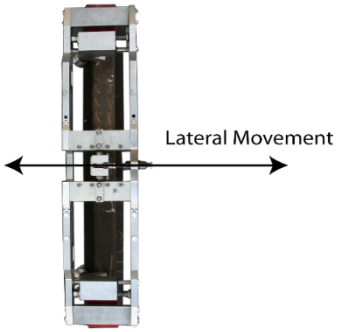
Typical test carriage holds two Roller Search Units (RSU's) with a total of 22 transducers (system can take up to 32 channels).

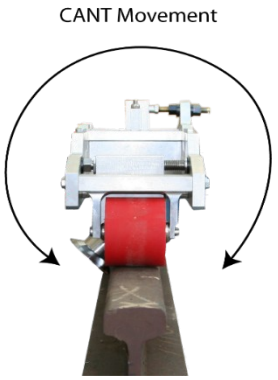


Gauge Tracking System

Maintaining gauge is controlled by either spindle rollers or gauge rollers (depending on infrastructure requirements).







RTI RFDV'S

GD Real Testing

• Probe Wheel configuration

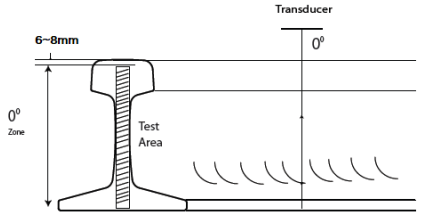


Figure 1 - Scanning Area 0°Type Probe

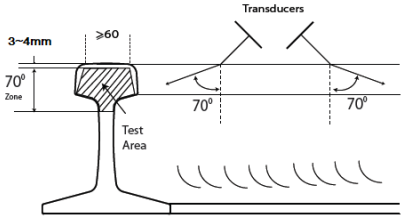


Figure 2 - Scanning Area 70°Type Probe

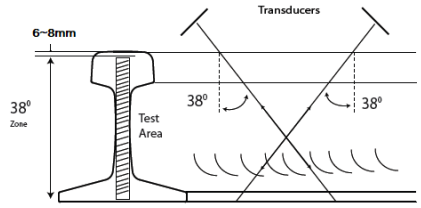


Figure 3 - Scanning Area 38°Type Probe

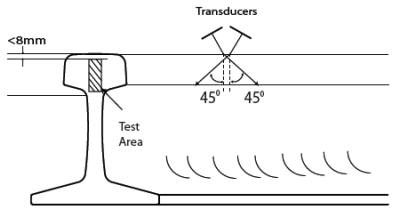


Figure 4 - Scanning Area VSH 45° Type Probe

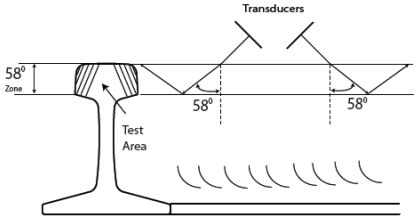


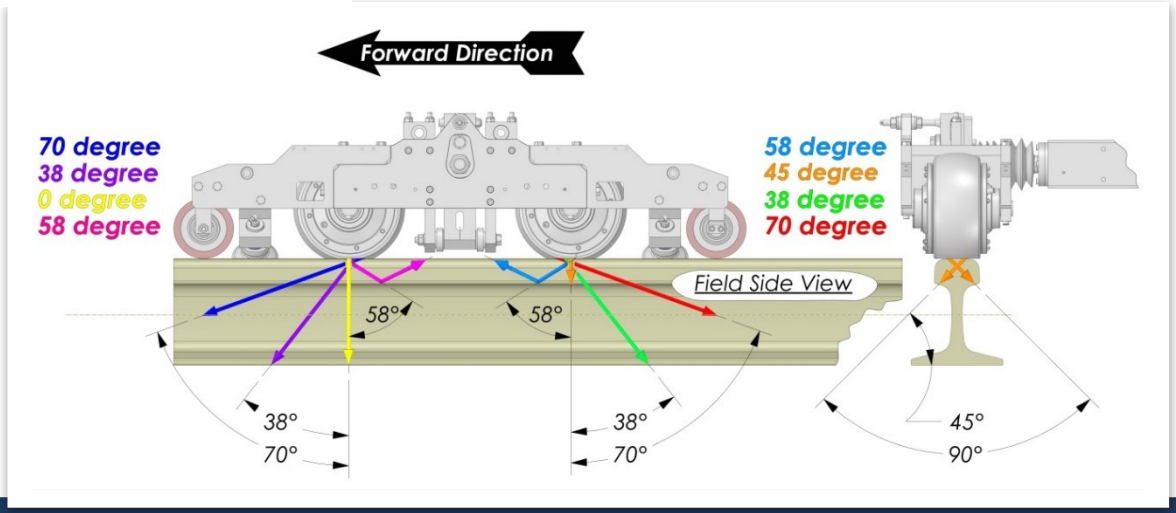
Figure 5 - Scanning Area 58° RHOM Type Probe

(optionally equipped)

Each carriage side mounts two probe wheels containing up to 16 channels (32 in total - can be optioned with more channels if required).

Configuration:

- 0° probes cover the centre section of the rail head, web and foot to detect horizontal split head and rail height.
- 38° probes cover the centre section of the rail head, the web and the centre section of the foot to detect transverse defects, bolt-hole cracks and weld defects.
- 70° probes cover the rail head to detect transverse defects, some surface defects and weld defects. Brush type is used.
- 45° probes cover the part of the rail head to detect vertical split head.
- 58° ROM probes (optionally equipped) cover the gauge and field corners to detect defects at the corners using second reflections.



• Automated System Calibration

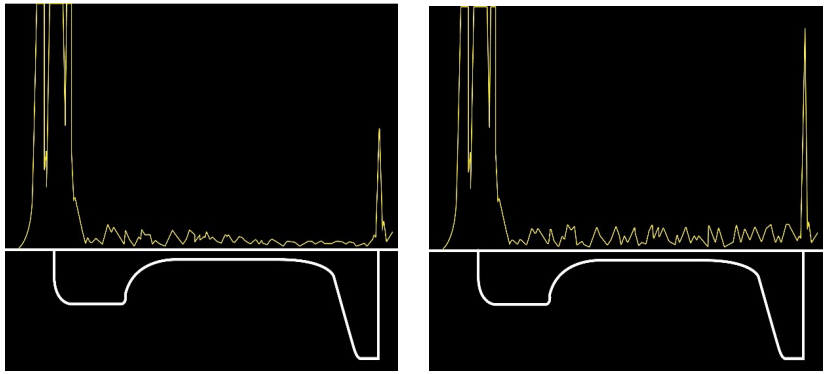
SmartCal™

First introduced in our 8000SX system. It provided a significant change in detection repeatability and for the first time RTI saw consistent data results from survey to survey across Operators.

The use of SmartCal into the 8800SX makes it possible to have absolute reference for each channel and for each position of depth by monitoring grain levels at different depths.

SmartCal adjusts the Depth Gains (Time Gains) individually for every channel with up to 32 individual gain points per channel.

The SmartCal system is exclusive to RTI and contributes significantly to both the high productivity and high precision of the 8800SX system.



0 Degree no SmartCal with SmartCal

0 Degree

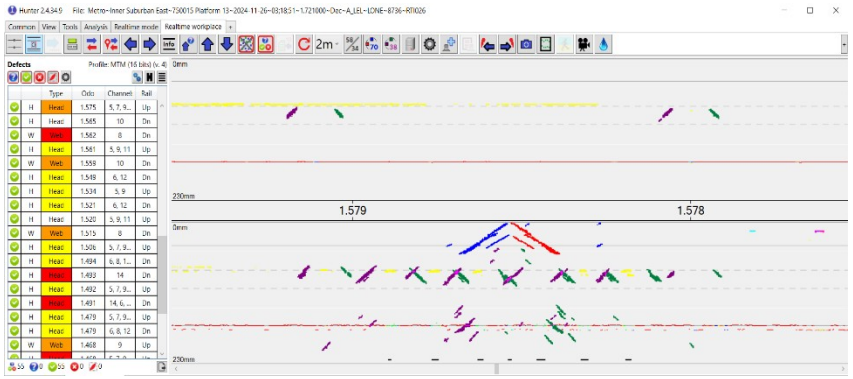
The Benefits of SmartCal™

- Remove subjectivity of operator
- Uniform signal response over the entire height of the rail (compensates for signal attenuation over distance travelled and in rail)
- Compensates for signal attenuation to improve detection of TDs under RCF
- Transducer gain drift caused by temperature variations is completely eliminated
- Fully compensates for non-linearity between transducers

A & B Scan (HGRM) Images

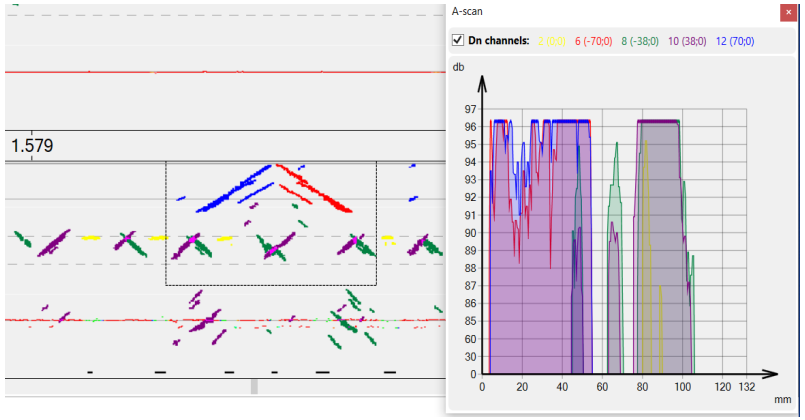
The Hunter Global Reflection Map (HGRM) is displayed as a B Scan image and shows data in real time. The raw data log (HGRM File) contains information pertaining to every recorded reflection including:

- The Odometer location
- The trigonometrically corrected depth
- The intensity of the individual reflector 0-1024 levels
- Graphical display of reflections



Lassoing a reflector, or group of, opens the A Scan information screen. The A Scan displays the Depth vs. Amplitude of the reflectors in track, similar to a Virtual Cathode Ray Oscilloscope

A complete recording of an A Scan from all channels with no threshold is recorded and synchronised with B Scan playback for quality assurance. In post run analysis this is used as a source for generating a quality index.

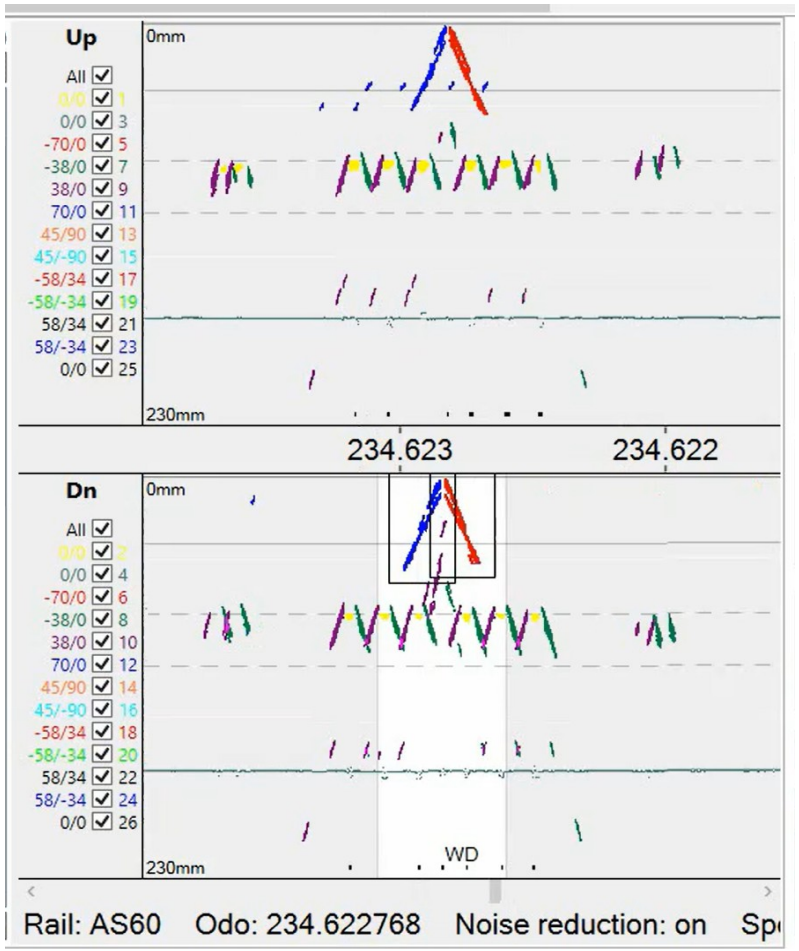


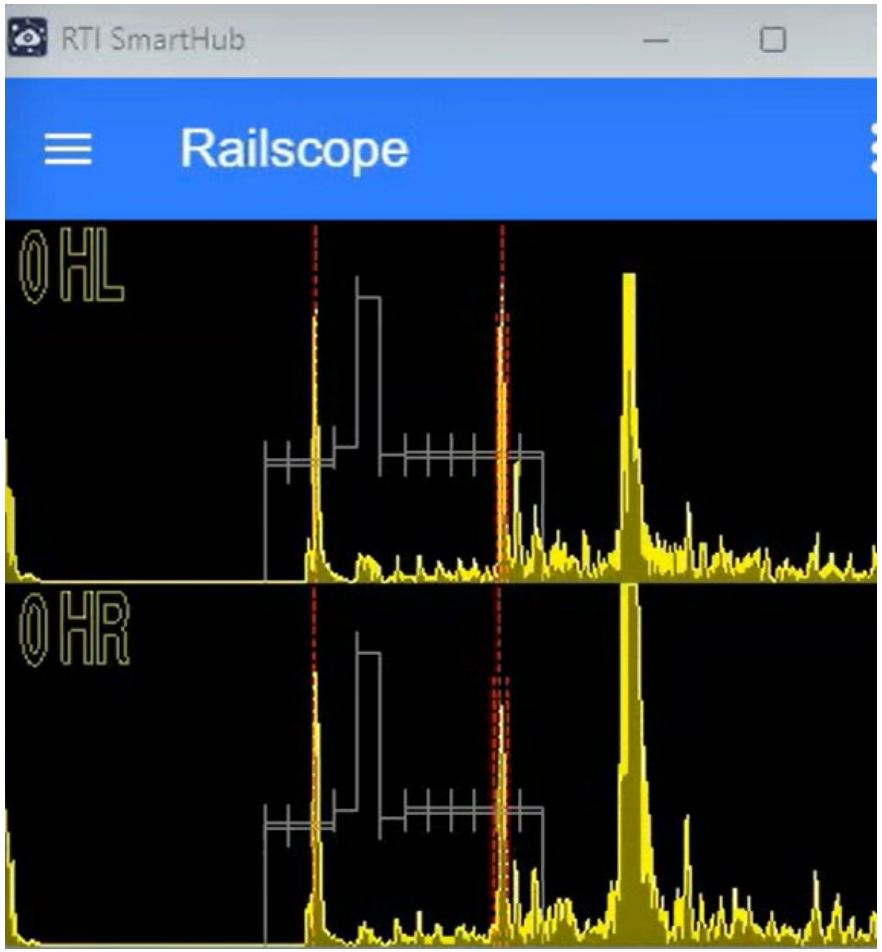
RTI RFDV'S

GD Real Testing

• Hunter Analysis System

A and B Scan and Railscope



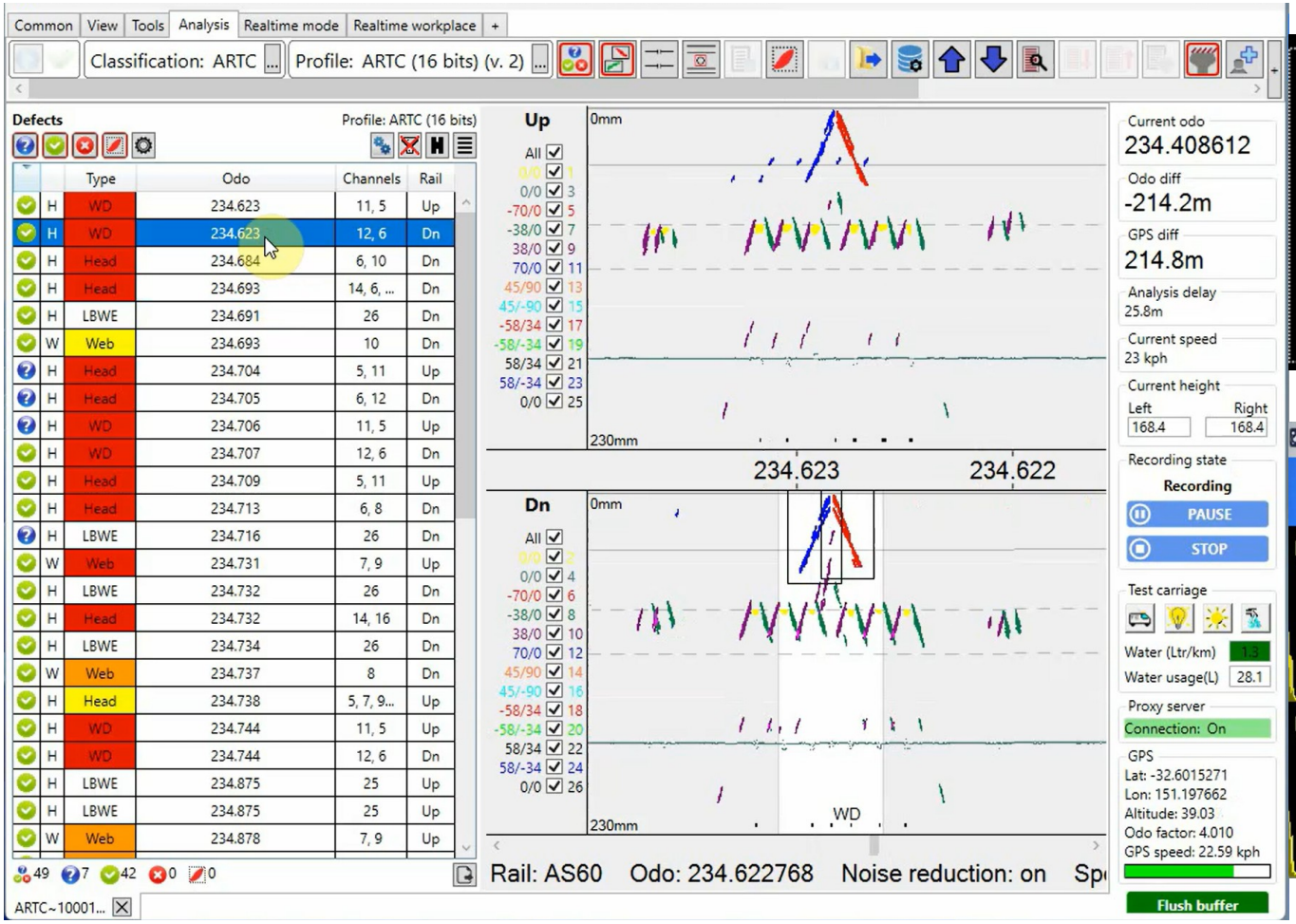


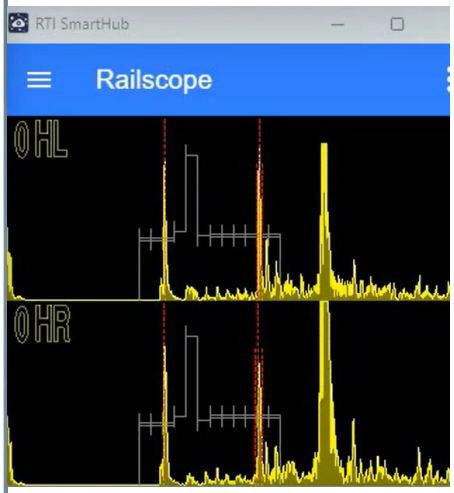
RTI RFDV'S

GD Real Testing

• Hunter Analysis System

Real Time Analysis - (Hunter)

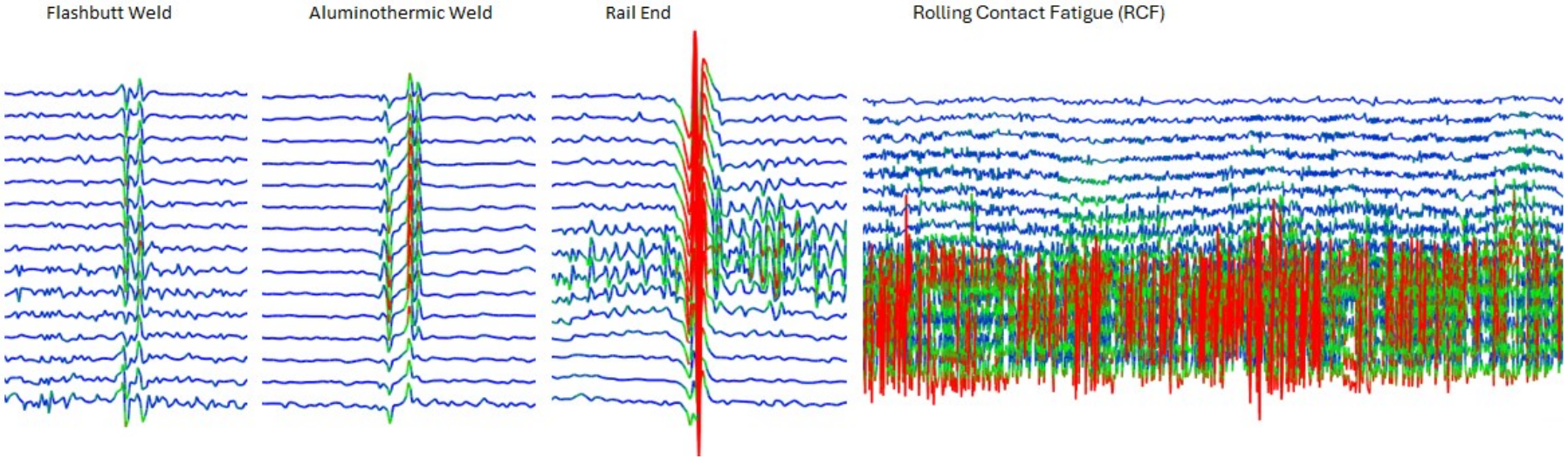




• Surface Map

Detection Capabilities

- Rolling Contact Fatigue (RCF)
- Surface Breaking Crack Detection in Switches and Frogs
- Squats
- Engine Burns
- Welds (Flashbutt, Aluminothermic & Manual Arc)
- Rail Ends



RTI RFDV'S

GD Real Testing

• Surface Map

Sample Report *

RTI can customise the reporting to client requirements

Side	Track	Odometer	Latitude	Longitude	Length (m)	Sub Severity	Width (mm)	Estimated depth (mm)	Type	Field	Centre	Gauge	ERM	GPS Plot (odo, lat, lon)		
Right	"MANUK-MANUKML_MAINL"	1.706622	-36.99484801	174.8748292	0.01	6	30	2	"HCC"	4%	93%	3%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.706612	-36.9948	174.8748
Right	"MANUK-MANUKML_MAINL"	1.705409	-36.99485248	174.8748167	0.01	5	30	2	"SQUAT"	5%	92%	3%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.705399	-36.9949	174.8748
Right	"MANUK-MANUKML_MAINL"	1.704819	-36.99485426	174.8748104	0.01	6	25	2	"HCC"	5%	95%	0%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.704809	-36.9949	174.8748
Right	"MANUK-MANUKML_MAINL"	1.704235	-36.99485576	174.8748039	0.01	4	35	3	"SQUAT"	8%	89%	3%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.704225	-36.9949	174.8748
Right	"MANUK-MANUKML_MAINL"	1.703619	-36.99485795	174.8747973	0.01	5	30	2	"SQUAT"	4%	91%	5%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.703609	-36.9949	174.8748
Right	"MANUK-MANUKML_MAINL"	1.702424	-36.99486238	174.8747852	0.011	4	25	3	"SQUAT"	4%	95%	1%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.702413	-36.9949	174.8748
Right	"MANUK-MANUKML_MAINL"	1.698269	-36.9948771	174.8747428	0.011	5	30	2	"SQUAT"	1%	93%	6%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.698258	-36.9949	174.8747
Right	"MANUK-MANUKML_MAINL"	1.697605	-36.99487919	174.8747358	0.061	6	30	2	"HCC"	8%	86%	6%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.697544	-36.9949	174.8747
Right	"MANUK-MANUKML_MAINL"	1.694064	-36.99489204	174.8746997	0.016	5	30	2	"SQUAT"	9%	87%	4%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.694048	-36.9949	174.8747
Right	"MANUK-MANUKML_MAINL"	1.693407	-36.99489438	174.8746929	0.013	6	25	2	"HCC"	5%	91%	4%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.693394	-36.9949	174.8747
Right	"MANUK-MANUKML_MAINL"	1.692216	-36.99489874	174.8746808	0.012	5	30	2	"SQUAT"	1%	91%	8%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.692204	-36.9949	174.8747
Right	"MANUK-MANUKML_MAINL"	1.691071	-36.99490246	174.8746687	0.012	4	30	3	"SQUAT"	5%	89%	6%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.691059	-36.9949	174.8747
Right	"MANUK-MANUKML_MAINL"	1.69044	-36.99490478	174.8746622	0.011	5	25	2	"HCC"	7%	90%	3%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.690429	-36.9949	174.8747
Right	"MANUK-MANUKML_MAINL"	1.689847	-36.99490692	174.874656	0.012	3	30	5	"SQUAT"	6%	89%	5%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.689835	-36.9949	174.8747
Right	"MANUK-MANUKML_MAINL"	1.689238	-36.99490903	174.8746499	0.012	6	25	2	"HCC"	7%	90%	3%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.689226	-36.9949	174.8746
Right	"MANUK-MANUKML_MAINL"	1.688658	-36.99491112	174.8746441	0.013	4	30	3	"SQUAT"	3%	89%	8%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.688645	-36.9949	174.8746
Right	"MANUK-MANUKML_MAINL"	1.687446	-36.99491532	174.8746315	0.011	6	30	2	"HCC"	2%	83%	15%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.687435	-36.9949	174.8746
Right	"MANUK-MANUKML_MAINL"	1.686934	-36.99491745	174.8746262	0.086	4	70	3	"SQUAT"	23%	60%	17%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.686848	-36.9949	174.8746
Right	"MANUK-MANUKML_MAINL"	1.686292	-36.99491977	174.8746198	0.013	4	30	3	"SQUAT"	2%	83%	15%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.686279	-36.9949	174.8746
Right	"MANUK-MANUKML_MAINL"	1.685709	-36.99492137	174.8746131	0.012	5	25	2	"SQUAT"	1%	92%	7%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.685697	-36.9949	174.8746
Right	"MANUK-MANUKML_MAINL"	1.685412	-36.9949224	174.8746101	0.194	6	25	2	"HCC"	3%	97%	0%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.685218	-36.9949	174.8746
Right	"MANUK-MANUKML_MAINL"	1.68516	-36.99492357	174.8746077	0.167	3	30	5	"SQUAT"	3%	93%	4%	"KiwiRail~MANUK~MANUKML_MAINL~2025-02-20~02-35-23~1.727000~Dec	1.684993	-36.9949	174.8746

Customised reporting version

Rail Side	Track	Chainage (Km)	"All" Surface Defect at LHRR Rail Conditional Index	"Squat" Surface Defect at LHRR Rail Conditional Index	Rail Side	Track	Chainage (Km)	"All" Surface Defect at RHRR Rail Conditional Index	"Squat" Surface Defect at RHRR Rail Conditional Index
LHRR	"EAL-EAL02_DT"	95.520			RHRR	"EAL-EAL02_DT"	95.520	8	8
LHRR	"EAL-EAL02_DT"	95.525			RHRR	"EAL-EAL02_DT"	95.525		
LHRR	"EAL-EAL02_DT"	95.530	12		RHRR	"EAL-EAL02_DT"	95.530	4	
LHRR	"EAL-EAL02_DT"	95.535	6		RHRR	"EAL-EAL02_DT"	95.535	16	
LHRR	"EAL-EAL02_DT"	95.540	6		RHRR	"EAL-EAL02_DT"	95.540	12	
LHRR	"EAL-EAL02_DT"	95.545			RHRR	"EAL-EAL02_DT"	95.545		
LHRR	"EAL-EAL02_DT"	95.550			RHRR	"EAL-EAL02_DT"	95.550		
LHRR	"EAL-EAL02_DT"	95.555			RHRR	"EAL-EAL02_DT"	95.555		
LHRR	"EAL-EAL02_DT"	95.560			RHRR	"EAL-EAL02_DT"	95.560		
LHRR	"EAL-EAL02_DT"	95.565			RHRR	"EAL-EAL02_DT"	95.565		
LHRR	"EAL-EAL02_DT"	95.570			RHRR	"EAL-EAL02_DT"	95.570		
LHRR	"EAL-EAL02_DT"	95.575	5		RHRR	"EAL-EAL02_DT"	95.575		
LHRR	"EAL-EAL02_DT"	95.580	2		RHRR	"EAL-EAL02_DT"	95.580	7	
LHRR	"EAL-EAL02_DT"	95.585			RHRR	"EAL-EAL02_DT"	95.585		
LHRR	"EAL-EAL02_DT"	95.590			RHRR	"EAL-EAL02_DT"	95.590	9	
LHRR	"EAL-EAL02_DT"	95.595			RHRR	"EAL-EAL02_DT"	95.595	14	
LHRR	"EAL-EAL02_DT"	95.600			RHRR	"EAL-EAL02_DT"	95.600		
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LHRR	"EAL-EAL02_DT"	95.610			RHRR	"EAL-EAL02_DT"	95.610		
LHRR	"EAL-EAL02_DT"	95.615			RHRR	"EAL-EAL02_DT"	95.615	4	
LHRR	"EAL-EAL02_DT"	95.620			RHRR	"EAL-EAL02_DT"	95.620	2	
LHRR	"EAL-EAL02_DT"	95.625			RHRR	"EAL-EAL02_DT"	95.625	2	
LHRR	"EAL-EAL02_DT"	95.630			RHRR	"EAL-EAL02_DT"	95.630	4	
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LHRR	"EAL-EAL02_DT"	95.640	4		RHRR	"EAL-EAL02_DT"	95.640	4	
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LHRR	"EAL-EAL02_DT"	95.660			RHRR	"EAL-EAL02_DT"	95.660		
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LHRR	"EAL-EAL02_DT"	95.670			RHRR	"EAL-EAL02_DT"	95.670		
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LHRR	"EAL-EAL02_DT"	95.675			RHRR	"EAL-EAL02_DT"	95.675		
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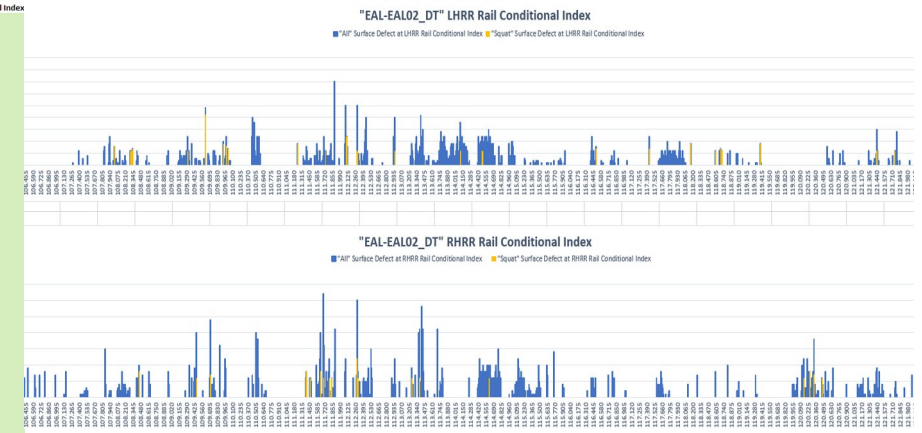
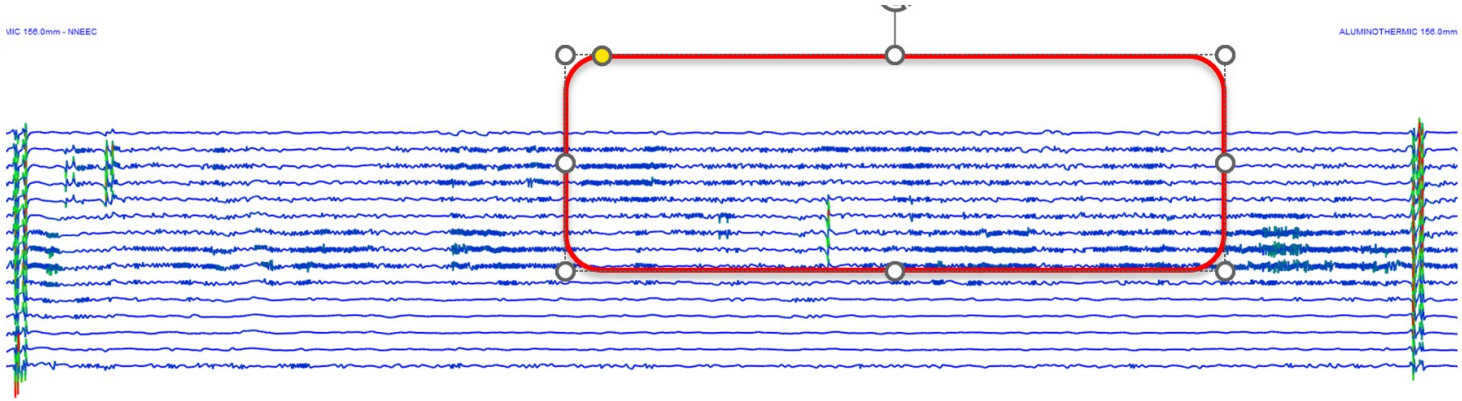


RTI RFDV'S

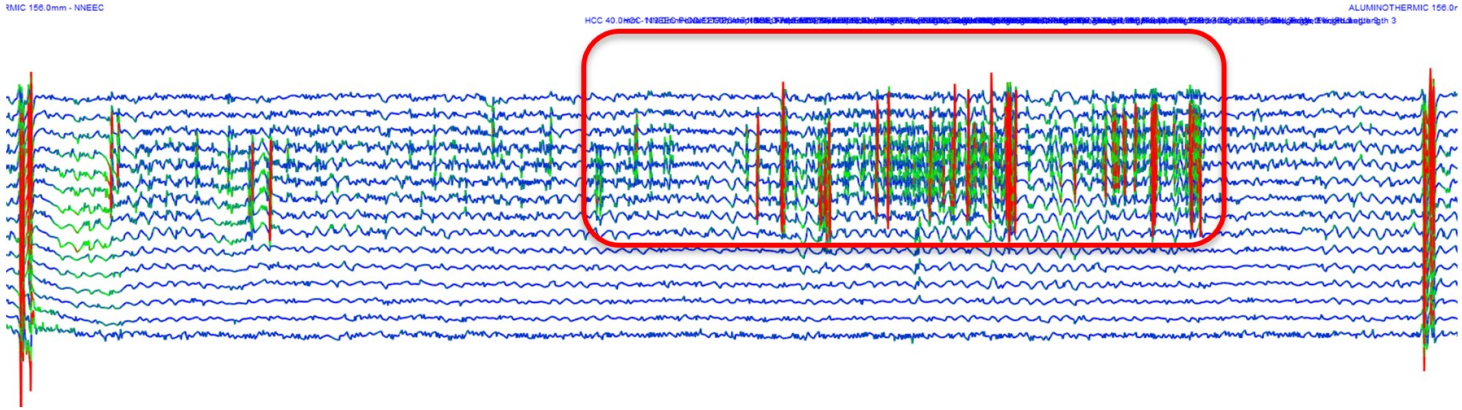
GD Real Testing

• Surface Map

Trending and Repeatability



Testing on 20th September 2024

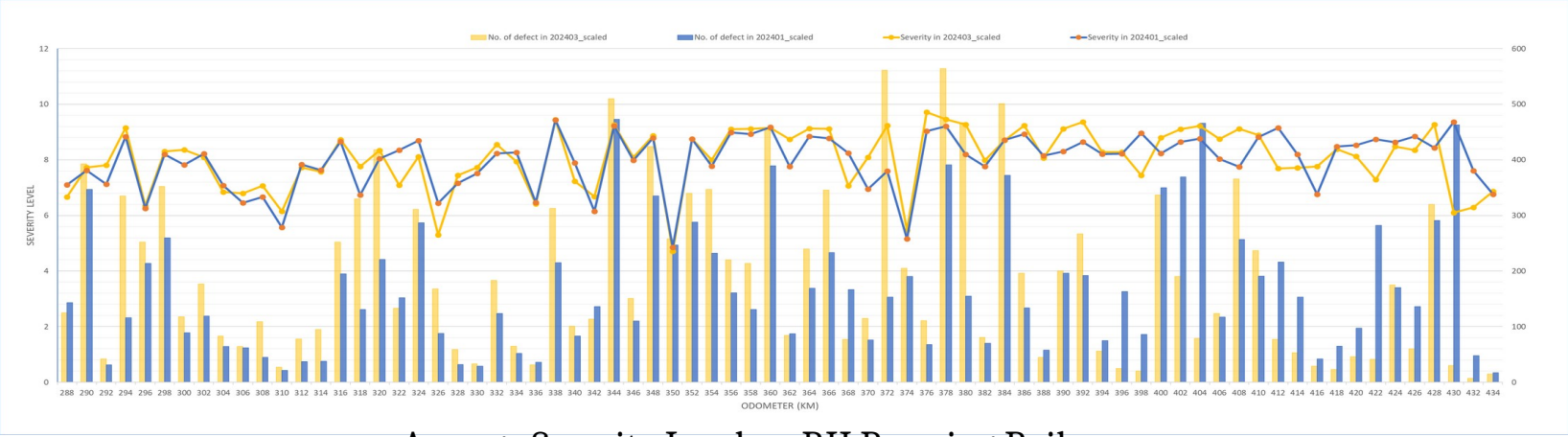


Testing on 01st March 2025 *(RCF was found at Head Centre & Field Side)*

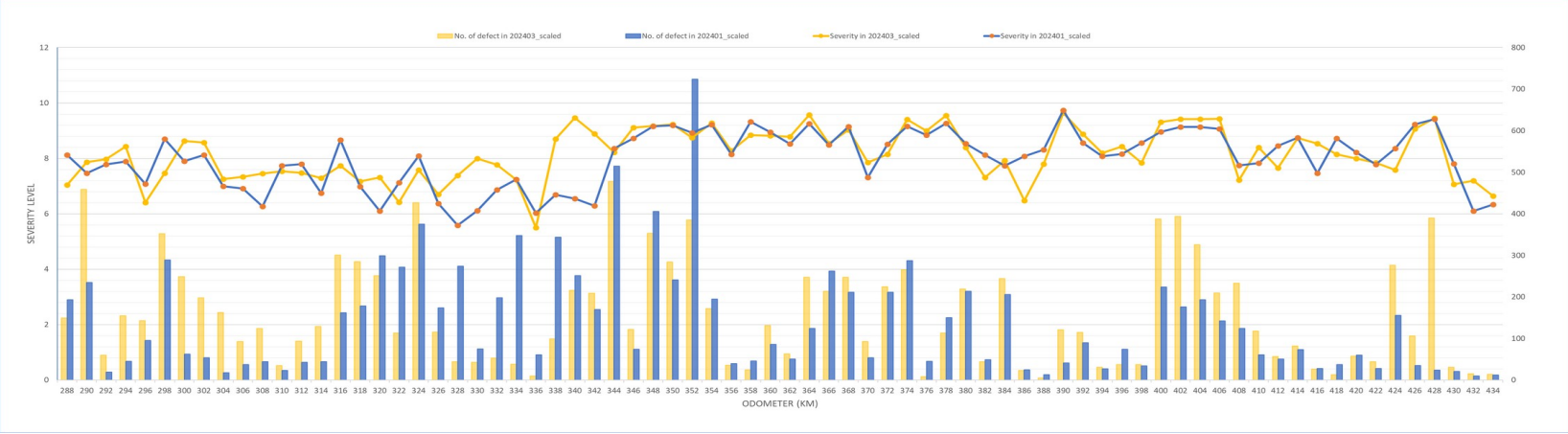
• Surface Map

Trending over Multiple Runs

Average Severity Level on LH Running Rail



Average Severity Level on RH Running Rail



Dual-use intelligent comprehensive inspection vehicle

Dual-use intelligent comprehensive inspection vehicle

GD Real Testing

• Vehicle Introduction

Highway and railway dual-use intelligent comprehensive inspection vehicle is equipped with 3D laser scanner, line scan camera, intelligent track inspection or track geometry status detection system, which can be widely used for comprehensive inspection of highway tunnels, mainline railway routine, and urban rail transit. At the same time, it can be used for emergency rescue of various transportation lines, as an accident site monitoring and remote monitoring platform.

Dual-use intelligent comprehensive inspection vehicle

GD Real Testing

• Major Function

- **Pure electric drive:** The vehicle is powered by pure lithium batteries, zero release, and suitable for the emission requirements of tunnel operation;
- **All terrain off-road:** The vehicle adopts four-wheel independent suspension and four-wheel drive, and has all-terrain off-road capability with strong overload capability.
- **Remote control:** When the vehicle is traveling on the track, It has two modes of manual driving and remote control driving;
- **Remote monitoring:** The vehicle is equipped with environmental video, real-time data transmission system, and satellite positioning system, which can remotely monitor the vehicle's operating status, location information and running trajectory in real time;
- **Harmful gas detection**: The vehicle is equipped with harmful gas detection system, 2 types of harmful gases can be customized according to user requirement (up to 8 types);
- **Laser scanning and line camera scanning**: It can detect tunnel structural deformation and apparent defects, and generate tunnel surface laser images using point clouds.
- The vehicle can be equipped with one of the following three devices: intelligent track inspection system, track geometry state detection system and Ground Penetrating Radar Detection system.

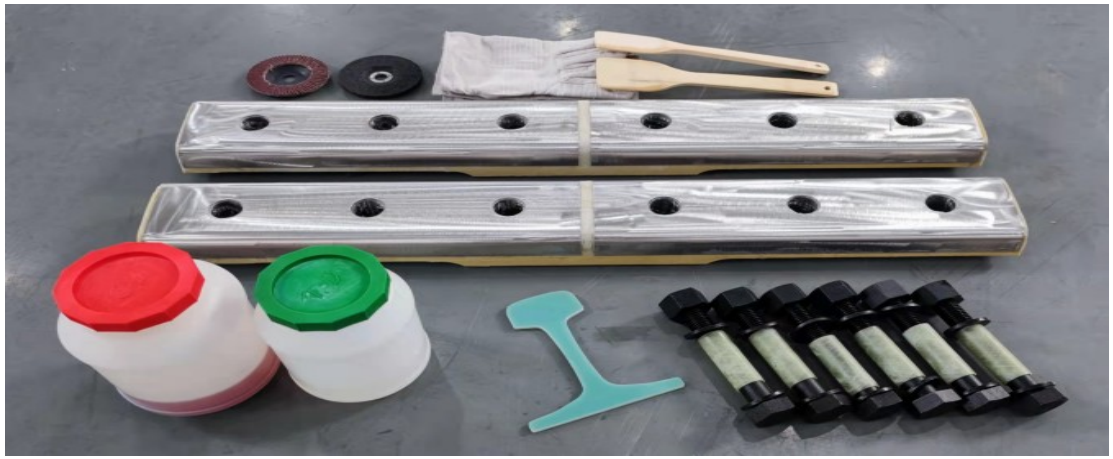
Adhesive Insulation Joint

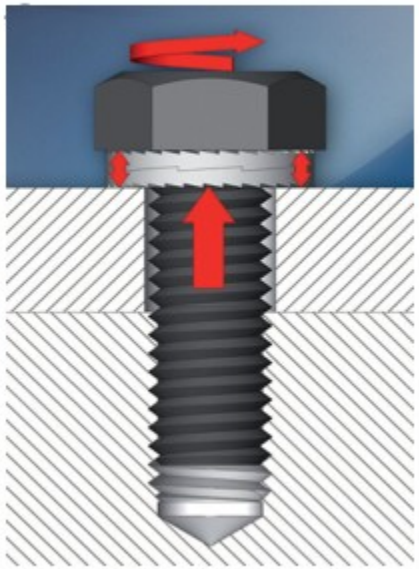
Adhesive Insulation Joint

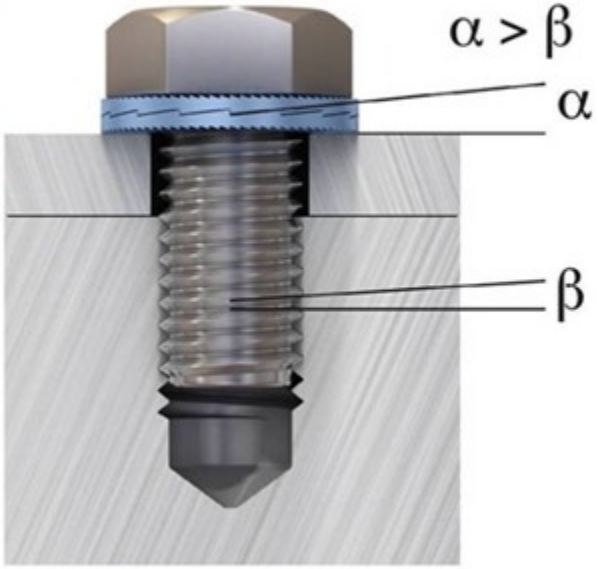
GD Real Testing

• Product Introduction

The on-site bonding insulation joint of steel rails is suitable for the automatic block track circuit separation section of continuous welded rail (CWR) lines, and is one of the key technologies for laying rail section on CWR lines. The product complies with the railway technical standard "Rail Bonding Insulation Joint" (TB/T2975-2018) and relevant regulations of CRCC (China Railways Test and Certification Center) product certification.
The STK-XJ on-site adhesive insulation joint comes in two specifications, STK-XJ50 and STK-XJ60, and is suitable for the construction, installation, and daily maintenance of new high-speed and conventional lines with a rail capacity of 50 kg/m and 60 kg/m. The product meets high standards and has wide applicability.
This product has been independently developed and produced since 2003, promoted for use on Chinese railway lines in 2008, and passed CRCC product certification in 2013. Up to now, this product has been continuously used in Chinese railways for nearly 20 years, with a total sales of nearly 90,000 units.
This product has been successfully applied on various railway lines in China and has withstood various environmental tests such as extreme cold, humid heat, sandstorms, and frozen soil.







Anti-Loose Washer

Anti-Loose Washer

GD Real Testing

• Product Introduction

ANTl-LOOSE washer is composed of two parts. When the bolt is pre-tightened, the large tooth surface between the two parts is wedged to engage, thereby achieving the self-locking function.
ANTI-LOOSE Washer is designed with the big tooth bevel angle "α" greater than the thread lead angle "β". In this way, the two washers become staggered when the bot loosens due to the greater distance in lift distance than the thread lift distance of washer. This expansion behavior in the axial direction in return leads to an increase in clamping force, enabling an effective lock the device under conditions of vibration, stress changes, temperature fluctuations, and other states

Embedded Part	Switch & Fishplates	Overhead Lines
Subway Conductor Rail	Bogie & Running Gear	Switch tamping machine

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