vossloh
enabling green mobility

SRE
SoniQ Rail Explorer
based on Fraunhofer IKTS PCUS®

Turnouts and rails

Versatile deployment

Can also be used during short track possessions (fast off-railing)

Also for manganese steel crossings

Co-developed with Fraunhofer IKTS Dresden

Ultrasonic Rail Tester SoniQ Rail Explorer

Technical Datasheet

SoniQ Rail Explorer:
Exact detection and location of rail defects

Developed in collaboration with Fraunhofer IKTS in Dresden, the ultrasonic rail tester SoniQ Rail Explorer detects internal irregularities resulting from track operations as well as rail base corrosion and volumetric defects. The data is displayed using B-scans and camera images, and transmitted directly to the office. The findings can be incorporated into digitalized process chains.

Benefits

/ Detects subsurface irregularities, volumetric defects in the rail head, web and base as per DIN EN 16729-1 as well as rail base corrosion incl. classification and determination of the error size
/ Without affecting track switching devices
/ Easy to use
/ Ultrasonic system with 10 pulser channels
/ Multiple ultrasonic views including synchronized A-scans and B-scans
/ Rugged tablet PC
/ Camera *(optional)*
/ Tracking system to provide location information
/ Higher standard of information thanks to Augmented Reality and Artificial Intelligence *(optional)*

Applications

/ For rail network operators, rail infra-structure and maintenance service providers
/ For pinpointing defects, regular inspections on short track sections, switches, level crossings and railways stations
/ No interference with switching equipment
/ Can be used during short track possessions
/ Can be used by EN 1 inspectors or higher
/ Software supports different rail profiles
/ Based on all the applicable standards and technical regulations of the railway industry
/ Enables condition monitoring of cast man ganese steel switch frogs

SoniQ Rail Explorer
Technical Data

Device type

- manually guided ultrasonic rail tester device with B-scan technology
- rails and switches as per DIN EN 13674-2
- detection of internal rail defects in the base, web and head (both gauge corner and field side)

Inspection technology

- Roller Search Unit with 10 channels and 9 independent probes employing the pulse-echo method

Measuring range

- 0°, 4 MHz
- 40° forwards and backwards, 2 MHz
- 70° center forwards and backwards, 2 MHz
- 70° satellite probes forwards and backwards for both the gauge corner and the rail's field side, 2 MHz

Analysis

- defect detection in accordance with DIN EN 16729-1
- detection sensitivity for internal and external rail defects guaranteed in accordance with RIL 821.2007A02

Optional extras

- images of the rail head surface taken during the inspection by an integrated camera
- image data linked to ultrasonic data and location
- PCUS® pro Single (compact electronics for manual testing) to connect to single, manually-guided probes (IE/SE) and use of the same software (A-scan)
- to inspect turnout frogs made of manganese steel in the track, defects such as cracks, inclusions, shrinkage defects and pores can be deteted inside the rail to a depth of at least 60 mm below the rail surface using the hand probes developed by **Ultra RS**.

Optional extras currently being developed

- the training of algorithms to classify and aid in detecting indicators (pattern recognition) when provided with a sufficient amount of consistent data
- indicators inside the rail displayed in a 3D volumetric image of the rail and visualized as a holographic tomogram (Augmented Reality or AR))
- an upgrade that allows simultaneous inspection of left and right rails in a single operation

Benefits

- no data lost if the power supply is suddenly interrupted
- without affecting track switching devices
- PDF export
- flexible software (PCUS® pro from Fraunhofer IKTS lab) for all commonly used Windows systems

---

- low center of gravity provides stability
- fold-out, height-adjustable side stand
- end stands front and back
- lateral outrigger *(optionally available)*

- inspection results displayed in real time while the data is being recorded
- indicators displayed together with their dimensions and positions
- input of route-specific parameters
- safety rating: device – IP54; electronics and tablet – IP65

- identifying marks, their positions and any comments can be added, saved and exported
- powerful, modular electronics (PCUS® pro Multi from Fraunhofer IKTS)
- USB 2.0 high speed

- subsequent adjustments of all parameters not related to recording data (incl. visualizations, gates)
- reduction of downtime thanks to remote diagnosis (maintenance access)

- annual service and calibration by the manufacturer in accordance with DIN EN 12668-1 or rather DIN EN ISO 22232-1
- CE-certified
- EMC-tested as per DIN EN 50121-1:2015 (DIN EN 50121-3-2:2017)

Dimensions / weight

full length with the handle up (ready for use)	880 mm
full length with handle folded down	approx. 1.110 mm
width	300 mm
height (ready for use)	approx. 940 mm
weight	20 kg, without 4 liters of couplant water

SoniQ Rail Explorer test wheel concept
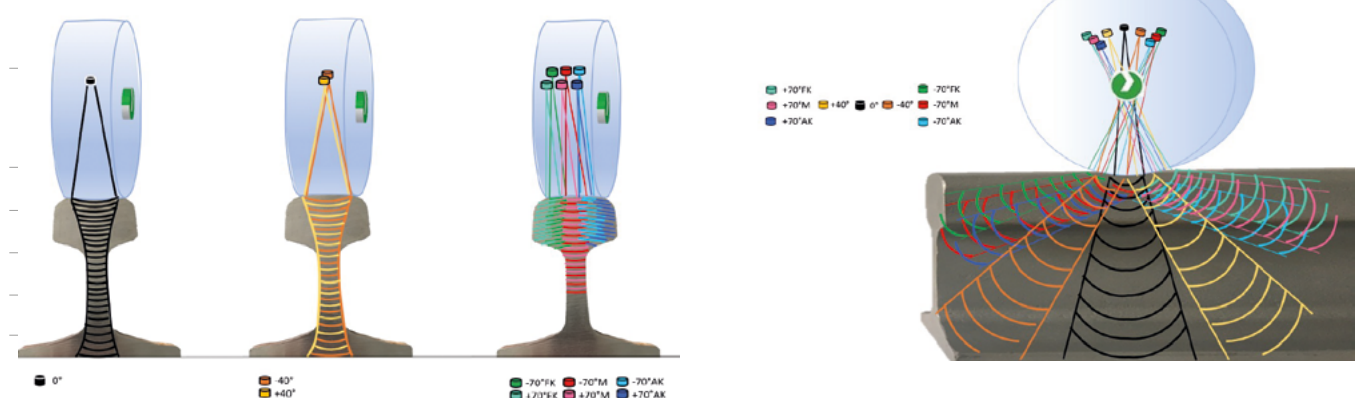
**Global expertise
in over 100 countries**

08/24