EURAILSCOUT Inspection & Analysis

Your reliable partner to monitor the condition of the railway infrastructure

To be able to ensure rail traffic safety and reliability, it is absolutely necessary to know the detailed condition of the railway infrastructure. The superstructure, track bed, turnouts, rails and catenary from an entire complex, whose individual components interact with each other.

The regular inspection and analysis of these components is a prerequisite for a condition-based, preventive maintenance regime, which in turn is a precondition for the sustained reduction of the life cycle costs of the railway infrastructure components.

Today, EURAILSCOUT Inspection & Analysis is the largest European independent inspection organisation for the components of the railway infrastructure.

EURAILSCOUT has its headquarters based in Amersfoort in the Netherlands and a branch office in Berlin/Germany, Paris/France and in Bologna / Italy. From these locations, we provide infrastructure monitoring services to clients throughout Europe.

We work with infrastructure companies and maintenance providers to develop and implement new concepts in monitoring and maintenance practices to ensure safety and to optimise the performance of the railway infrastructure.

In doing so, the latest measurement systems, modern test and measurement cars, fully developed processes, and an exemplary quality management system are the basis for a team of more than one hundred, qualified employees who will be pleased to assist you with finding solutions to your problems.
01. Track

We inspect:
Over 50,000 kilometers of track each year

To ensure a safe environment for railway operation, track geometry measurements as well as video data are essential; the monitoring of these should be carried out without disturbance to normal railway operation.

For the track environment EURAILSCOUT can provide high precision track geometry data and high quality video images. All data is recorded on vehicles that can operate at speeds up to 160 km/h, thus avoiding any disturbance to other railway operations. The logistics of measuring a defined part of any infrastructure network without missing any sections and without disturbing normal operation is an issue, which should not be underestimated.

Track geometry
With respect to track geometry parameters, the requirements are defined in the European Standard EN13848. However due to national specifics and for historic reasons every client has different needs regarding additional parameters and their definition.

For track geometry recording EURAILSCOUT combines a non contact laser based optical gauge and an inertial measurement system. The location information is gathered by a distance measurement calculation based on the same inertial system together with odometers and satellite based D-GPS data.

Standard geometry parameters recorded are:
- Track gauge
- Vertical profiles (top)
- Horizontal profiles (alignment)
- Super elevation (cant)
  - Twist with different base lengths [calculated from the cant signal]
  - Inclination
  - Equivalent conicity
  - Cross section profile

More specific parameters such as cyclic top, cant deficiency [depending on speed] and dip angle can be part of the product as well. In fact any parameter based on the principal signals can be created.

Both inertial and chord parameters can be provided by the system. It is therefore possible to measure all track geometry parameters according to a national or customer specified standard and according to the new European standard EN 13848 on one single run. Wave length bandwidths and threshold levels can be configured independently or according to specified standards. The system is very flexible and can meet any customer or country specific requirements.

Visual inspection (video)
An additional means to monitor track reliability is the recording of image data. With line scan imaging defect sleepers and missing fasteners can be found an seen. The drivers view images can allow any railroad employee the get a digital view of the track, anytime

Rail corrugation
The non-contact laser-based system for identification of rail corrugation (short wave rail head faults) measured every 5 mm to identify all kinds of corrugation between 10 mm and 1 m on each rail. Up to four wavelength bandwidths can be configured to assess different kinds of corrugation in one single run.
02. Switch

We inspect:
200 switches in 6 hours

Switches cause about 50% of the track based disruptions to the availability of a rail network. EURAILSCOUT Switch Inspection & Measurement vehicles allow for a complete non-contact inspection and measurement of the switch without taking the switch out of service. This will enable the infrastructure owner to observe exceedances before they become disruptions or safety hazards. This all, whilst economizing on the maintenance expenses with efficient life-cycle cost management.

Inspection
With high resolution line scan camera’s, you’ll have the best view of your track, in the comfort of your office. This enables you to have a full visual inspection of the switch. It allows you to take the time you need for the assessment or a second opinion, as there will be no train waiting until the switch is in service again.

Measurement
A high speed rail profile measurement system, capable of geometry measurements conform EN13848, captures the condition of your switch under loaded circumstances. High coverage rail profile cross-sections make it possible to perform in-depth inspections of for example the switch blade and frog area. Quantifying the switch under operating conditions allows for accurate and reproducible safety assessments. The SIM is monitoring your switches as they are during day-to-day operations.

Switch Inspection & Measurement (SIM) - Features and Arguments
• Track condition monitoring as a service
• No people on the track, no train service interruptions
• Objective quality evaluation of the switches, digitally stored
• Loaded measurements give realistic track and switch conditions
• EURAILSCOUT’s data localization works without track adjustments (RFID is optional)

With the low profile, the SIM can be pulled and pushed by a single locomotive, allowing for quick shunting between the regular traffic. This allows EURAILSCOUT to inspect and record 200 switches (both paths) in and around Amsterdam Central station, in 6 hours.

The most rapidly developing measurement concept in the railroad track sector, enhances the availability of the infrastructure, allows for the possibility of maintenance depending on the condition, increases safety in and on the track and reduces life-cycle costs.
03. Rail

We inspect:
100,000 kilometers of rails each year

Since the early 1970s – in those days still under the umbrella of Dutch Rail - we have been successful service providers in the area of basic security track inspection. Already in 1976 we started with the interruption-free track inspection with our track inspection vehicle UST 76, which became known very rapidly in many countries. New ultrasonic probes in combination with improved ultrasonic probe carriers allow an examination of the rails in all safety-relevant areas of the rail profile in rails and turnouts, with the exception of the frog.

**Eddy Current**

The trains equipped with 16 channel Eddy Current systems, are able to cover the complete running surface of the rail. EURAILSCOUT is therefore capable, of not only detecting head checks at the gauge corner, but also other rolling contact fatigue defects. The inspection area is compliant with the new extended inspection area described in prEn16729-2. It is an improved insight in asset status.

**Manual measurement**

EURAILSCOUT also provides ultrasonic hand measurement services, either for track inspection or to verify suspects determined by a measuring train. Our experts are trained and experienced to work according the requirements, as defined by the customer.

Our qualified employees ensure consistently high quality through constant advanced training and cover all certification levels in ultrasonic testing methods, eddy current and visual inspection pursuant to EN 9712 and/or ASNT.
04. Overhead line

We inspect:
Overhead lines up to 160 km/h

A full survey of overhead lines can be carried out at speeds up to 160 km/h using EURAILSCOUT’s measurement trains. The various trains are equipped with innovative measurement and diagnosis technologies for many aspects of an overhead line inspection.

**Measuring and Inspection Systems**
Non-contact laser systems scan the height and horizontal position up to four contact wires, with automatic corrections for the rolling motion of the carriage body, which is measured separately.

**Hit detection/incidents and incoming wires**
EURAILSCOUT has a measurement system for hit detection and horn contact detection of the contact wire at the pantograph. They are combined into a system called “ConForM1”. Horn contact sensors detect the range of outgoing and incoming wires. Hit detection sensors detect incidents in the catenary system.

**Contact wire thickness measurement**
Cameras make a continuous, non-contact survey of the contact wire to assess wire wear. The pictures are used to evaluate the width of the wearing surface and are stored separately to the measurement results.

**Position of mast poles**
The position of the mast poles along the tracks is recognised automatically by laser-based systems and stored with the measuring and inspection data. The positions are shown in the results of the measurement data.

**Video survey**
The visual recording of the overhead line system is done with area and line scan camera’s. Every 1.5m a high resolution image is taken. During nighttime, infrared illumination images are recorded.

Today’s inspection and analysis of overhead line systems at normal and high speed guarantees the safe and trouble-free operation of trains.
05. Signal

We inspect:
Safety through ERTMS, GSM-R and ATB measurements

Track Circuit, Euro Balises and ERTMS Monitoring
- Using dedicated sensors and software installed on our fleet, EURAILSCOUT is able to monitor information from the rail as ATB or Track Circuit.
- Euro Balises, ERTMS components are also measured and stored for further analysis.

Any anomalies in the signal or message can be reported but also comparison with previous measurements are possible to anticipate breakdown and improve reliability.

All these measurements can be done simultaneously with other measurements (track geometry, overhead line or ultrasonic) to reduce cost and traffic management.

ATB Monitoring
The ATB-EG system is a train control system which permits rail traffic to operate at high speeds when clearance is given. Any faults, anomalies or the absence of the ATB signal can result in unnecessarily slow train operations or complete traffic stoppages. Regular monitoring of the quality of the ATB signals ensures that any problems are detected at an early stage, before they can interfere with actual train traffic.

GSM-R Monitoring
The closed GSM-R network was developed and built especially for use in the railway environment. Currently, the system is being used for phone calls between the engineer and the traffic controller/dischapeter. In the new European safety system ERTMS, this network will increasingly play a decisive role, as more and more data applications, such as the transmission of timetables, are enabled via this system. Recurrent monitoring of these systems makes it possible for infrastructure operators to ensure the necessary signal quality of the GSM-R network is maintained.

EURAILSCOUT specialises in measuring the radio coverage and signal strength of the GSM-R train radio network. The radio coverage and reception quality of both the analogue train radio (Telerail) and the new digital train radio (GSM-R) can be measured at speeds up to 140 km/h. These measurements play an increasingly important role in the refinement of the new European GSM-R train radio system everywhere.

The communications link between the trains and the traffic control centre is of vital importance, not only for the announcement of minor delays, for instance, but also in case of an accident.