

Railway Measurement Runs



What Are Railway Measurement Runs?

[Railway](#) transport is one of the safest means of transportation in Europe due to the fact that it undergoes rigorous testing and strict criteria. **Railway measurement runs** involve collecting and analysing data during the actual operation of rail vehicles. These runs measure critical parameters such as the **forces between the wheel and rail, accelerations** in the suspension stages, and **relative distances of moving components**.

At Applus+ Laboratories, we utilise our expertise to **execute measurement runs and long-term measurements**, providing a comprehensive understanding of the stresses experienced by rail vehicles. This information is essential for assessing the impact on service life, verifying operational strength, and optimising structures to **prevent potential issues**.

Why is Railway Measurement Runs Important?

Railway measurement runs are crucial for **maintaining the safety, reliability, and efficiency** of rail transport. By understanding the stresses and conditions experienced by rail vehicles, operators can:

- Assess the impact on service life
- Verify operational strength
- Optimise structures to prevent issues before they arise

What Railway Measurement Runs Do We Provide?

We offer an **extensive range of measurement services** designed to address various needs within the railway industry. Our services include:

- Approval and validation measurements
- Damage case analysis
- Running characteristics technical and load collective measurements
- Force measurements
- Measuring wheelsets
- Measuring brake systems
- Torsional vibration measurements
- Assuming railway operational services for measurement runs
- Modal analysis and operating vibration analysis
- Measuring railway noise and vibrations
- Electrical measurements
- Pantograph measurements
- Structure monitoring

Stress Measurement and Test Drives

Our **stress measurement and test drives** capture the stresses that rail vehicles experience **under actual operating conditions**. Through continuous monitoring, we record mechanical and electrical variables under **static and dynamic loads**. This includes installing **complete measurement chains**, including process adaptation, to ensure accurate data collection. We create load assumptions that serve as the basis for calculations using the **finite element method (FEM)** and various in-house tests.

Whether operating in Helsinki, Melbourne, or Dresden, our on-site measuring service offers extensive capabilities with **high channel counts** and **sampling rates**, accommodating for harsh environmental conditions and autonomous measuring in regular use. We execute tests in accordance with application guidelines for distance and route trials in the rail vehicle sector, according to the standards **DIN EN 13749 and VDV 152**, and with data evaluations according to EN 17149 and the FKM-Guideline.

Long-Term Measurements

We support **long-term measurements** for data acquisition during actual operation, crucial for assessing the **impact on service life** and **verifying operational strength**. Our systems can monitor structures, components, systems, and plants, bespoke according to your specific requirements, reliably informing you about load or damage incidents immediately.

We measure analogue signals such as **strain gauges, accelerations, and displacements** in conjunction with GPS and bus data across numerous assignments in various areas. This extensive data collection allows for **detailed assessments**, including location-based evaluation of measurement data **over durations of several years**.

Modern Measuring Systems

Our modern measuring systems utilise **digital measurement technology** and a variety of transducer types to collect, record, and process both static and dynamic parameters. These parameters include:

- Force and torque
- Displacement
- Pressure, elongation and strain
- Speed and acceleration
- Relative air humidity

We register elongation and strain using two methods: firstly, as **strain gauge based**, and then with optical measurements **via our ARAMIS system**, capable of in-plane and out-of-plane deformation measurements. For rapid processes, such as free-fall trials, we employ **high-speed cameras**.

We incorporate **our own software solutions** to visualise data in real time, including **rainflow counting** and **envelope calculations** according to additional algorithms. We also employ **telemetry systems** to collect and record measurement data from rotating components, ensuring comprehensive data capture across various scenarios.

Why Choose Applus+ Laboratories for Railway Measurement Runs?

Choosing [Applus+ Laboratories](#) for your railway measurement runs means partnering with a **distinguished leader in the railway testing industry**. Our many years of experience **guarantee effective solutions** for status, condition, and load analysis. We offer more than just executing measurement runs.

We are committed to **ensuring your rail vehicles are safe, reliable, and compliant** with global regulations and standards. By choosing Applus+ Laboratories, you gain access to advanced testing facilities, **cutting-edge equipment**, and a team of experts dedicated to delivering **high-quality services** and **expert guidance**.