Efficient maintenance:
Monitoring the infrastructure using regularly scheduled trains

for track system and vehicles

continuous condition monitoring

reliable forecasting

higher quality operations

DB Systemtechnik

Modern condition-based maintenance strategy: **A small number of vehicles monitor the entire infrastructure!**

DB Systemtechnik has developed an effective and economical method for continuous monitoring of condition and operation. With train-borne monitoring of the infrastructure in regular service, wide areas of the infrastructure can be monitored with just a small number of regular, scheduled trains in addition to conventional systems.

Track side and vehicle benefits

- Ensuring continuous inspection of the track system.
- Raising operating quality levels as a result of detecting faults early as a result of continuous inspection.
- Ability to plan maintenance work more efficiently, saving time and money.
- Continuous proof of quality.
- You can determine the ride comfort of your vehicles on the infrastructure as well as the interaction between vehicle and track.

We are happy to advise and support you with competence and impartiality

- in designing and planning your individual maintenance concept.
- in selecting the necessary components, so that you can gain maximum advantage from corrective and preventive maintenance.
- in engineering, ensuring the installation and adaptation of the measuring systems run smoothly
- during commissioning of the system and of the transmission technology.
- by operating and through the provision of data analysis.

Operating principle

Data transmission by radio to control center

GPS tracking

Measurement computer in the train

IMU (gyrometers) and accelerometers inside

Accelerometers on the axle bearing and bogie

Monitoring the track geometry quality

- A regular scheduled train equipped with measuring systems determines the vertical track geometry (longitudinal level) according to DB-standard for track assessment.
- By using evaluation algorithms and data processing, condition data and forecasts regarding the potential for fault development of the longitudinal level parameter are delivered.
- This information is evaluated and edited for the Infrastructure Manager, highlighting the condition of the track rapidly, displaying only essential information.

This ensures Infrastructure Managers are able to remotely monitor the condition of technical assets at all times.

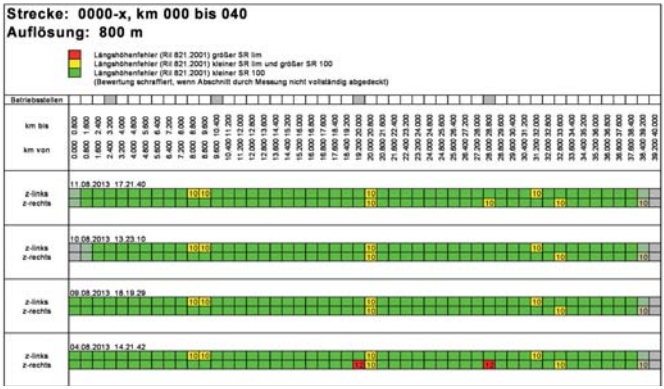
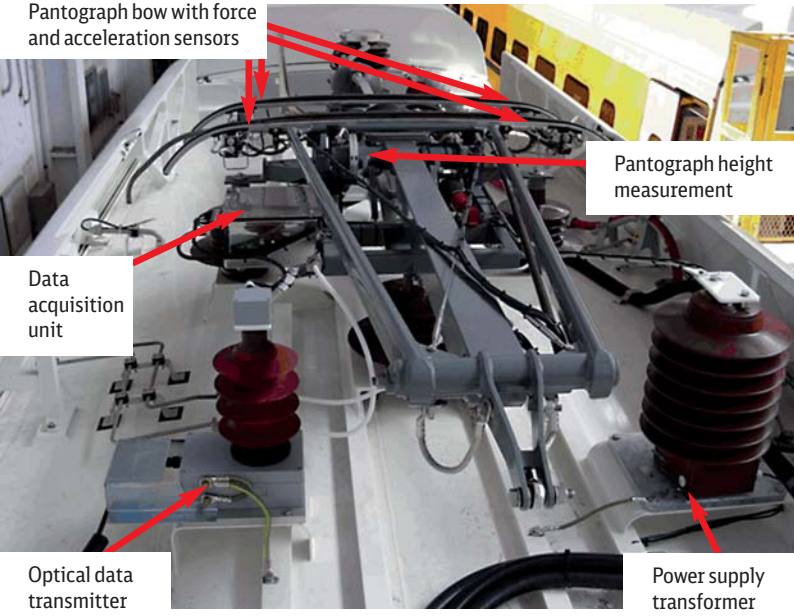


Diagram: Monitoring the track geometry – interactive log of a track section

Operating principle

Photo Credits: DB Systemtechnik



Monitoring the overhead contact line

- A standard train equipped with measuring systems performs function tests on the dynamic behaviour of the catenary system.
- This is achieved thanks to the aid of sensors mounted on the current collector.
- The measured signals are recorded and analysed in the integral evaluation computer.
- Alarms and measurement evaluations are transmitted via a suitable interface (e.g. LTE).

Our services are QMS-certified as specified in ISO 9001:2008

References

Deutsche Bahn
For many years, the German railway network has used an ICE 2 Highspeed train, equipped with measurement systems, for the monitoring of the infrastructure.

Features of the measurement system:
- Conforms to EN 13848-2 standards requirements.
- Approval by DB Netz AG has been issued.
- Autonomous operation and redundant system.
- Measurement system can be controlled remotely.

By January 2015 the ICE 2 had already covered more than 5 million measurement kilometres (approx. 1,500 km per day) in normal operation. Since the installation of the measurement system on the ICE 2:
- No faults have occurred in the measurement system.
- The operation or scheduling of the train has not been impeded in normal operation.
- No additional workshop time has been required for the installation and maintenance of the measurement system.

ÖBB – Austrian Federal Railway
It is planned to use a Class 182 electric locomotive to record the status of the overhead contact line on the Austrian rail network. Pilot operation will begin shortly.

Features of the measurement system:
- Internationally proven service for overhead contact line inspections and vehicle approvals.
- No testing staff are required on board in normal operation.
- Conforms to the requirements of the EN 50317 standard.
- Maintenance of the hardware can be embedded efficiently in the planned maintenance intervals of the scheduled train.

Title photos: DB AG/Wolfgang Klee, Bernd Lammel

DB Systemtechnik offers solutions in all fields for condition-oriented maintenance. Contact us and we will be happy to tell you more!

Vehicles monitoring the infrastructure

Installed in/on standard vehicles to monitor the track condition, among other parameters

- **Standard and measurement train systems**
  Details in this brochure!

Infrastructure monitoring vehicles

Installed in/at the infrastructure to monitor the vehicle condition, among other parameters

- **Checkpoints**

Vehicles monitoring themselves

Installed in/on vehicles to monitor the vehicle condition, among other parameters

- **Vehicle systems**

Infrastructure monitoring itself

Installed in/at the infrastructure to monitor the system condition, among other parameters

- **Infrastructure systems**

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Details subject to change without notice
Last modified September 2015
www.db-systemtechnik.de