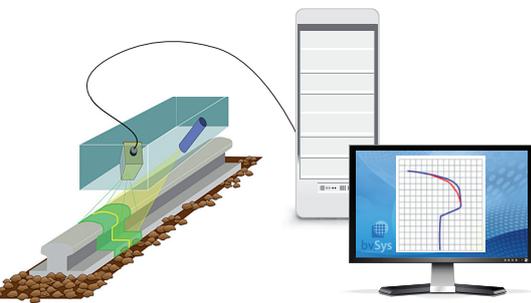![bvSys logo](bvSys BILDVERARBEITUNGS SYSTEME)

3rdRailPositionCheck

The contact rail firmly in view: safe position monitoring

3rdRailPositionCheck allows the real-time, automatic measurement of the
• lateral position and
• height
of the contact rail relative to the side rail

3rdRailPositionCheck is an automatic real-time measuring system to determine the position of contact rails on tracks. Measurement reports are generated as a result that show the deviations of the contact rail's position from the set position and generate an error message if tolerances are exceeded. In the basic version, the system works up to a speed of 130 km/h at a measurement interval of 10 cm. Higher speeds and shorter intervals are possible depending on the requirements.

Principle

The measuring system is based on the split-beam method and in each case consists of a line laser and a camera. A laser line projected onto the rail is recorded by means of a special digital camera. Powerful computers automatically evaluate the image data and generate the reference points necessary for the relevant position. Using these reference points, which are generated by four sensor units, the position of the 3rd rail is calculated relative to the side rail. Figure 1 shows the basic set-up.


Principle of measurement

A digital image is taken and analysed at a distance of 10 cm, controlled by a rotary encoder. Thanks to the path-dependent image recording and analysis, each measurement can be assigned a clear position on the track.

The resulting images are evaluated using an ultra-modern image processing algorithm to firmly identify the laser line in the image.

Summary

The system is characterised by the following features:
• High measuring speed at a short measuring distance
• Resolution of <1mm
• High measuring certainty
• Modular design
• Low maintenance
• Easily integrated since low space requirements both below and in the vehicle
• Open system; thus easily adapted to specific national database systems and/or central data acquisition in the vehicles
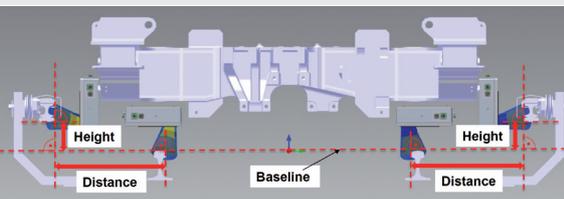
Measured Values

Measurement result

The measurement result (right figure) shows the path-dependent measured values and highlights large deviations from the set value. Rising and falling ramps are also identified and measured.

Ramp (ident. by angle + length)   Error

3rd Rail Height / left side
x-Axis: location
y-Axis: height [mm]
dashed lines mark admissable tolerance

Error

3rd Rail Distance / left side
x-Axis: location
y-Axis: distance [mm]
dashed lines mark admissable tolerance

Error   Ramp (ident. by angle + length)

3rd Rail Height / right side
x-Axis: location
y-Axis: height [mm]
dashed lines mark admissable tolerance

3rd Rail Distance / right side
x-Axis: location
y-Axis: distance [mm]
dashed lines mark admissable tolerance