



Watson Industries Application Notes

Railway Track Testing

Accurate and detailed data on track conditions is critical for the safety of rail passengers and employees. While there are significant technical challenges in manufacturing gyros for this environment, Watson Industries has the expertise, the technology and the proven experience to provide the best products for this application.



Watson Industries manufactures sensor packages that give data on track superelevation (roll angle), roll rate, yaw rate, truck hunting, and track irregularities.

Technical Challenges:

The accuracy needed in this demanding environment requires the best sensors. Gyros with low drift and superior noise performance are critical to measuring superelevation angle. Furthermore, these gyros must withstand the high vibrations of railway track testing without induced noise errors.

Watson Industries has incorporated our VSG line of gyros into our railway sensor packages. These gyros are rugged and are proven to provide superior performance in this environment for extended periods of time.

Watson Experience:

Watson Industries has been supplying sensors to the rail industry since 1987. In that time several types of products have been supplied to many customers.



Watson Industries, Inc.

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Requirements:

- Roll Angle: $\pm 15^\circ$
- Rate range: $\pm 50^\circ/\text{sec}$
- Lateral acceleration: $\pm 0.5\text{ G}$, 2 G rms
- Shock: 200 G
- Temperature: -40°C to $+50^\circ\text{C}$
- Vibration: 4 G rms
- Velocity Input – Our sensors in this application require a velocity input from an outside source. There are three options for this input: An analog voltage, digital RS-232 signal, or pulses from an encoder wheel.

Applicable Products:

- TMS-E232
- DMS-E604
- DMS-E604/205 (DMS with GPS option)

Typical Options:

We are able to accommodate your custom needs. Shown below is a listing of our most common custom modifications.

- Digital velocity input – Watson can support digital velocity inputs in many formats such as GPS and Airspeed Indicators.
- External GPS reference – We have built custom units that utilize GPS data as a reference.
- Custom specifications – For certain applications, customers require specifications that are different from our standard units. Watson Industries engineering is willing and able to accommodate these needs.
- Input Voltage – Many different input voltages can be accommodated.
- Output Format – Communications Protocols RS-422, USB, ARINC, Syncro
- Data Format – We have made many products with custom formatted data outputs.
- Sensor Ranges – The ranges for most of our sensors can be expanded or reduced to meet your requirements. Some of our gyros can have ranges of up to $\pm 3000^\circ/\text{sec}$.

Options specific to this application:

- Non-standard mounting orientation



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