

Igualada - Railway Track Monitoring

CLIENT: FGC - FERROCARRILS DE LA GENERALITAT DE CATALUNYA / INFRA**Tec**

How an integrated multi-sensor wireless monitoring system helped engineers understand track behaviour in varying weather conditions.



Challenge

The Llobregat - Anoia railway is a metre-gauge line operated by FGC - Ferrocarrils de la Generalitat de Catalunya (Railway of the Autonomous Government of Catalonia).

Concern had arisen regarding changes in track geometry in response to variations in temperature. There was particular interest in a section of the track with a tight curve (radius of 105 metres in length of 300 metres). The engineers responsible for the line wanted to model track behaviour and needed information on displacement of the rails, as well as the ambient and rail temperature.

A monitoring system was needed that was easy to install and remove after a three-month period.

There was a need to compare movement of the track and sleepers with other structures such as overhead line equipment (OLE) gantries.

Solution

A wireless condition monitoring system from Senceive was selected for the project. This was installed by Spanish instrumentation and monitoring experts INFRA**Tec**.

The solution comprised optical displacement nodes with integrated tilt sensors measuring movement of the rails. In addition, external temperature nodes were fitted to the rails and integrated with the wireless monitoring system using Senceive PT100 RTD sensor nodes. These were fixed to the sleepers with adhesive.

A number of optical displacement sensors were also installed on the OLE gantries using adjustable brackets that were highly stable and quick to fit and remove.

Senceive sensors work autonomously, and can operate without maintenance for up to 15 years. Measurement data was transferred wirelessly every 30 minutes to be accessed by stakeholders using WebMonitor software.

Outcome

The FlatMesh™ system was quickly and efficiently installed, without disrupting train movements. It provided the required information over a three-month period. This enabled analysis of the relationship between track movement and changes in temperature.



KEY POINTS

- **Railway operator concerned about excessive track movement due to big variations in temperature.**
- **Combined displacement and temperature measurement in single wireless system.**
- **Easy to install and remove for short-term deployment.**