



R^tGM The tool for real-time, automatic grouting control on railway tracks

CLIENT: **GEO3TEC**

THE CHALLENGE

The first line of Ferrocarriles de la Generalidad de Cataluña (FGC) opened in 1863 (Sarriá train). Low Llobregat lines were launched at the beginning of the 20th century. In this second area and due to both the age of the infrastructure and variations in the water table together with five serious flooding events, in some parts ground was washed away resulting in cavities below the tunnels' bottom slab.

Starting on summer 2021 and in different contracts through autumn 2023 in Low Llobregat, Geo3Tec has been the company responsible for carrying out consolidation grouting in the invert portion on which FGC's ballast and railway tracks are located. This ground treatment is carried out during night shifts making it essential to identify, in real-time, any deformations caused to the railway tracks. The line must be back in service at the first convoy of the day (5:00am), with full confidence on infrastructure and passengers' safety.

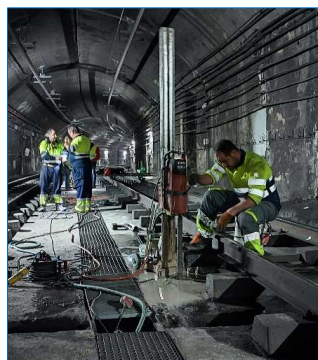
23:56 Próximas salidas Next departures			
Destino	Hora	Via	Observacions
Origen	Area	del	Observacions
Observacions	Observacions	Observacions	Observacions
LS Moli Nou	23:59	1	
RB Pl. Espanya	00:03	2	
SB Martorell Enllaç	00:14	1	

THE SOLUTION

R^tGM is our real-time monitoring tool to control grouting works. With a frequency of two minutes, data acquisition is supported by FlatMesh (Senceive). This WiFi-type mesh is capable of retrieving and sending data from control systems, at once and in real-time.

Data are displayed on Ingenia's Web platform (PC, Tablet, App), minimizing latency since the time they hit Senceive's database. Results are available in engineering units, in a flexible format easy to understand, ready to speed up decision making.

In addition, Ingenia offers configuration to preset thresholds, producing warning messages when the defined values are reached.



THE OUTCOME

Senceive's remote, wireless monitoring system along with Ingenia's Web platform grant the ability to control any grouting issues involving the railway tracks, in real-time. Ingenia's different options allow monitoring both through the Web and at the project itself, minimizing the latency time between measurement and data display.

The client refines grouting pressures and volumes with R^tGM, ensuring minimal impact on railway tracks in service, all of it in real-time and with no cable laying.



Data visualization on Ingenia (2D map and deformation vectors).