Geotechnical monitoring of the Eppenberg tunnel

COUNTRY	PROJECT TYPE	SECTOR	MAIN PRODUCT
SWITZERLAND	TUNNEL MONITORING	CONSTRUCTION	LOADSENSING

Challenge

When work started in 2015 on the 3,114-meter Eppenberg Tunnel, it was clearly an important moment for the canton of Soleura in Switzerland. The tunnel was designed to link the towns of Aarau and Olten and decongest traffic on one of the most transited railway routes in the country, used by 550 trains every day. But an infrastructure project of this type required permanent and reliable geotechnical monitoring to detect any incident that might affect the works.

Solution

Contractor Terra Vermessungen, one of the leading monitoring companies in Switzerland, opted to solve the challenge with a Loadsensing wireless system. Loadsensing allows Terra to gather readings from the geotechnical instruments used across the Eppenberg Tunnel works. The remote monitoring system covers 55 load anchors and five extensometers, all controlled from a central gateway outside the tunnel. The system's wireless operation and low power consumption offered a minimum-impact way of guaranteeing that the system does not interfere with construction work.

"Loadsensing is very easy to use. You attach the node next to the load cell, connect the cable to the node, do a quick configuration and that's it. I think the most important benefit is the wireless connection, in combination with the long range and the low-power consumption. This cable-free product is great for locations like tunneling sites. In addition, the long battery life makes Loadsensing perfect for nodes in remote spots, for example rocks, where you would usually need a professional climber. With Loadsensing I don't even think about installing cables and I don't have to change batteries every couple of weeks."

Erdmann Jacobeit
Terra Vermessungen

Benefits

Loadsensing's robustness, flexibility, ease of expansion and low power consumption have given Terra a highly efficient monitoring system. The system integrates seamlessly with the many geotechnical instruments that Terra uses for measurements. And by using Loadsensing software to automate the supervision of sensor measurements, Terra has been able to eliminate most manual readings, saving the company's staff from having to travel to site to gather data. This has cut the cost and the time needed for supervision. Terra's experience with Loadsensing has been such a success that it was featured in the prestigious engineering magazine Ernst & Sohn.

Advantages

- Enhanced safety from real-time collection and analysis of geotechnical data
- Easy integration into a wide range of geotechnical instruments
- Reduced costs by avoiding on-site instrument readings

1 - The Eppenberg Tunnel during construction