



CASE STUDY

# Wireless Telemetry Revolutionises Highway Tunnels Monitoring for Enhanced Safety and Efficiency



**PROJECT TYPE:** Highway tunnel monitoring

**COUNTRY:** Greece

**INDUSTRY:** Infrastructure

**MAIN PRODUCTS:**

- 1 Ackcio Gateway (BEAM-GW)
- 2 Ackcio Analogue Node (BEAM-AN)

# CHALLENGE



**During the annual maintenance of a twin highway tunnel in Greece, the asset owner realized the need for continuous monitoring of some cracks in the tunnel linings to ensure the quality and safety of the structure.**

NEOTEK, a solution provider in Greece specializing in instrumentation and industrial applications in the fields of civil, mechanical, geotechnical, structural and seismological engineering, was engaged for this task.

Traditional wired dataloggers would have required extensive installation efforts, including many well-trained workers and many days of work laying conduits from the sensor positions to a central data acquisition unit. This approach would have resulted in prolonged working hours, traffic disturbance, and increased material and workmanship costs.

Having installed in the past traditional cabled systems to monitor cracks at various highway tunnels all over Greece, NEOTEK understood these limitations firsthand and sought a wireless telemetry solution to streamline the monitoring process.

# SOLUTION

**NEOTEK selected the Ackcio wireless monitoring solution to address the challenges associated with traditional cable systems. This eliminated the use of conduits, long working hours and traffic disturbance while allowing the owner to monitor from his office the measurements.**

Only two people were required to install the sensors and nodes and configure them to the gateways, which were pre-installed by the owner with NEOTEK guidance, in the link tunnels. Each installation job was finished in a matter of no more than 4 hours, most of which was moving and setting the lifting truck into the desired installation positions.

11 BEAM-AN-S1 Analogue Nodes were deployed and connected to analogue displacement sensors installed in the highway tunnels. One gateway was installed per direction per tunnel, monitoring up to 4 sensors each. The distances between the installed Ackcio Nodes and Gateways varied, with the longest distance being approximately 130 meters. This allows for continuous monitoring of cracks expansions, providing crucial information for the safety of the tunnel.



# RESULTS

- ✓ **Continuous data stream easily accessible**
- ✓ **Smooth on-site deployment**
- ✓ **Enhanced infrastructure safety**
- ✓ **Effective crack monitoring**

The installation of Ackcio Beam system significantly improved the efficiency of crack monitoring during the annual maintenance of highway tunnels. The elimination of conduits and long working hours not only reduced costs but also minimized traffic disturbances. The wireless solution added substantial value to the asset by providing real-time, remote access to measurements. NEOTEK praised the ease of working with Ackcio, highlighting their dedicated support and commitment to meeting the specific needs of the project at hand.



# BENEFITS

## **Efficient Installation:**

- Quick installation completed in under 4 hours per job.
- Minimal disruption during annual maintenance works.

## **Cost Savings:**

- Elimination of conduits reduces material and workmanship costs.
- Optimal resource utilization with only two personnel required.

## **Remote Monitoring:**

- Ackcio's wireless solution enables remote monitoring from the owner's office.
- Real-time data access without on-site visits.

## **Quality Monitoring:**

- Effective monitoring of existing cracks enhances overall asset value.
- Ensures structural integrity through continuous quality assurance.



# TESTIMONIAL

*High end quality equipment, enthusiastic people, thorough and immediate technical support, always a pleasure to work with Ackcio.*

— **Katerina Xystri**  
*Sales Director*  
NEOTEK



**ABOUT NEOTEK** Founded in 1969, NEOTEK is a Greek company actively specializing in the supply and technical support of instrumentation involved in scientific research and industrial applications in the fields of civil, mechanical, geotechnical, structural and seismological engineering.



**ABOUT ACKCIO** Ackcio builds reliable wireless data acquisition systems for industrial monitoring applications. The company automates monitoring processes and provides remote, intelligent data to enable increased safety and efficient risk management in mission-critical industries, including construction, infrastructure, mining, and rail. Ackcio's flagship solution, Ackcio Beam, is an industrial data acquisition platform that uses a patented long-range wireless mesh network to monitor sensors accurately and reliably in both above-ground and underground environments. Ackcio is headquartered in Singapore and supports clients across the world. In 2021, the company was included in Forbes Asia's inaugural '100 to Watch', a list of small companies and startups on the rise across Asia Pacific.

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