

NPL helps Senceive to offer improved monitoring of structural assets across the UK

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Senceive sensors monitor UK rail infrastructure. Credit: Senceive

The National Physical Laboratory (NPL) has worked with wireless sensor network developers Senceive, to help them deliver improved monitoring of degradation across critical structures in the UK that will save costs and improve safety levels.

London-based Senceive's main application area is long-term infrastructure monitoring. The company's meshed systems of wireless sensors are used to assess the condition of railway structures, track, bridges, culturally significant buildings and even historical artefacts. The sensors enable managers to plan essential maintenance rather than reacting to problems when they occur, prolonging the lifetime of structures and lessening the likelihood of accidents.

Senceive's [wireless sensor](#) networks are highly complex embedded systems, so it can be a challenge to quantify the uncertainties involved. As the system is designed for structural health monitoring-type applications, generating reliable data is critical so Senceive asked NPL to help them improve their products by understanding their measurement challenges.

Initially Senceive needed NPL's help to improve their tilt sensing system and verify its accuracy, precision and limits. NPL characterised the output of Senceive's tilt sensors in terms of linearity, jitter and overall uncertainty. NPL also advised Senceive on system improvements and on future deployments. This has given Senceive a greater understanding of the measurement issues they face, and prepared them for an upcoming large-scale deployment.

The results from the work have given Senceive the confidence of knowing how well their sensors perform with real data to back up their datasheets.

Michael Collett from NPL said:

"NPL provides companies with access to world-leading support and expertise across a wide range of technical areas. By working with NPL, Senceive have been able to understand how to get the most out of their system and validate their results. NPL has also learned a lot by working with a commercial company in the fast moving sector of [wireless sensor](#) networks."

Michael Gois at Senceive said:

"Working closely with Michael Collett and tapping into the great depth of expertise at NPL has been invaluable in helping us understand the measurement challenges we are faced with, and enabled us to

incorporate some significant improvements into our system design."

Senceive has been working with NPL since 2009. It has supplied the Laboratory with wireless sensors to monitor a 14 tonne footbridge that is 20 metres long and 5 metres high. NPL is loading the bridge to destruction and the effects monitored to find new ways of maximising the lifetimes of civil structures.

Provided by National Physical Laboratory

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