



## FlexiMeasure™

### Application Focus: Horizontal Monitoring

#### Horizontal Monitoring Challenges

The use of movement sensors deployed in a horizontal string can deliver significant benefits in many structural and geotechnical applications. Precise, reliable, automated monitoring instruments can warn stakeholders of problems and inform long term decision-making, helping to protect assets and people. Instruments such as inclinometers have been used to measure vertical earth movement and structural deflection for at least 30 years. Widely available inclinometer options share a number of limitations however: they tend to be heavy and hard to handle, power-hungry and not very flexible. This limits their value in many engineering or mining applications where sites tend to be remote from mains power supply and hard to access due to factors such as time pressure, rough ground or restricted space.

#### Solution: FLEXIMEASURE™

FlexiMeasure™ from Senceive provides an alternative that is easy to transport and use, highly adaptable and built around the company's well-proven, precise, triaxial wireless tilt sensors.



In geotechnical applications FlexiMeasure™ is a modern carbon fibre in place inclinometer (IPI) solution used to measure settlement or heave. By recording the movement in a trench or embankment, for example, it is possible to determine settlement profiles (which could be used in the process of estimating volume loss in the case of tunnelling).

Examples of horizontal monitoring applications include:

- ground settlement, e.g. railway trackbed or road with tunnelling below.
- ground heave due to changing water table
- monitoring movement of concrete ground slab

In soil settlement or consolidation monitoring, FlexiMeasure™ can be used to determine when required compaction levels have been achieved before being re-deployed elsewhere on the project, or in a completely different application. Used in structural monitoring applications, a string of FlexiMeasure™ segments can be embedded in, or attached directly to, a building or structure to measure change in vertical profile.

Example applications include settlement of retaining walls, bridges (e.g. due to scour) and other civil engineering structures. Because it is quick to install and easy to re-deploy it is ideal for use on structures that are under construction,

or on third party assets nearby. And with virtually no maintenance requirements, it is also well-suited for longer term structural health monitoring.

The carbon fibre segments can be connected in seconds and are available in four lengths, ranging from 0.5 to 3 m. Up to 32 segments can be used per string. A number of casing options are available, including 59 or 49 mm ID inclo casing. Segment lengths can be mixed to suit the application, which means that it is not critical to know the exact string length before installation - potentially preventing the need for costly re-mobilisations. With a single one metre segment weighing just 250 g it is often possible for one person to carry a full system to site and install it in less than an hour.

FlexiMeasure™ self-configures on site, with data transmitted via a smart 4G/PoE/WiFi gateway to WebMonitor - Senceive's cloud based visualisation software.

**FlexiMeasure simplifies complex horizontal monitoring challenges, providing a precise, robust way to monitor settlement and heave in structural or geotechnical applications.**