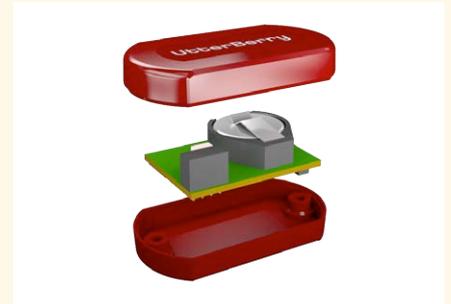# Innovation Winner 2015
UtterBerry Wireless Sensor Devices

UtterBerry wireless sensors will revolutionize civil engineering instrumentation and monitoring, rendering the task easier to perform, with better measurement precision, and yielding dependable results in real time. They offer almost zero-power electronics, a powerful microprocessor, artificial intelligence and wireless communications. A sensor weighs 15 grammes and is about the size of a box of TicTacs.

Before UtterBerry, civil engineering monitoring devices were large, high-power consumption devices with minimal processing power, which limited their application of wireless sensor technology. Equipment to ensure structures were stable, safe and that construction was not causing disturbance to pre-existing structures nearby required substantial effort during set up, calibration, operation and day-to-day maintenance. Data was collected and transmitted but could not easily be processed or interpreted by engineers.

UtterBerry devices collect, process and interpret measurements in real time, transmitting the information wirelessly to any internet-enabled device. They also use artificial intelligence to analyse trends that predict pending and future events.

UtterBerry devices measure displacement and tilt in three axes, as well as other variables such as vibration, temperature and humidity. The electronics are totally unique with optimally power efficient circuits and a more powerful microprocessor designed from the ground up. Sensors only wake-up and begin measuring when they detect movement and battery life is measured in years.

UtterBerry's founder Heba Bevan was formerly a CPU design engineer with ARM. This gave her experience and knowledge about emerging technologies, how their power consumption and reliability could be improved, and how the hardware could be optimised, miniaturised and made robust enough for the construction industry. Heba also researched low-power electronics with Cambridge University, first testing her technology by independently deploying 52 sensors in the Liverpool Street station Post Office tunnel.

The Costain Skanska JV Crossrail tunnelling at Mile End Park and Eleanor Street is a great example where the UtterBerry solution saved millions of pounds, and provided unparalled monitoring technology, particularly in a sealed environment with no human access. UtterBerry met the desired client outcomes by deploying the tiny devices which require no wires for data or power, no working at height, and with sensors and measurement algorithms delivering meaningful information to site engineers. The system was up and running within one hour.

When benchmarked against other technologies, key criteria included: overall project installation time/complexity (impacting overall price); cost; equipment weight (affecting transportation, fixing); automation of analysis (some systems required backroom treatment of data before reporting); calibration; cabling (installation, weight, cost) and health and safety. UtterBerry sensors proved superior in all categories. Leading edge electronics, combined with onboard artificial intelligence and data reporting to the cloud has successfully been applied to civil engineering monitoring equipment to enable smart infrastructure monitoring.

UTTERBERRY

Judges comments

This is brand new technology (patent pending), representing a quantum step in measurement sensors – not just providing data but also intuitively merging geo-technical with artificial intelligence. The innovation overcomes site challenges each time it is used, has harnessed the latest emerging technologies and hugely improves on what currently exists.

This product has been developed from good solid R&D and demonstrates that thorough research, allied with practical testing produces impressive next generation products.

Finalists

- Hausmate Building Intelligence (Hausmate)
- Imtech Paperless Site (Imtech)
- Oxford University Museum of Natural History Glass Roof Restoration (Beard)
- East Kent Phase 2 Re-signalling Project (Network Rail)
- P21+ Repeatable Rooms (ProCure21plus Partnership Group)
- Project Safety Defect (Kier Services)
- QEII Bridge Expansion Joint Replacement (Connect Plus Services)
- UtterBerry Wireless Sensor Devices (UtterBerry)