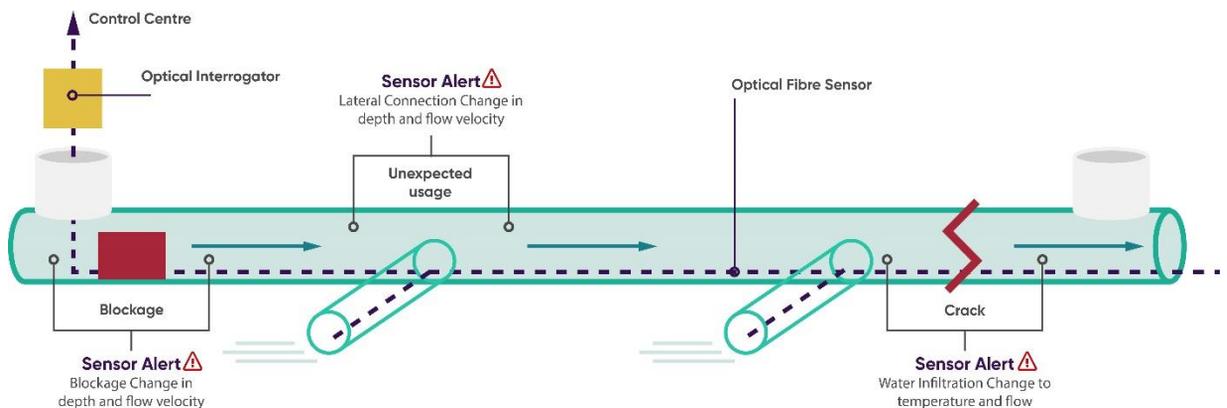


nuron fibre sensing technology is a step-change for sewer monitoring. It continually measures multiple flow parameters and communicates real-time data to operators for proactive and predictive management.

A Step Change for Sewer Management

1. **An end-to-end optical fibre sensing solution** for the monitoring, measuring and management of flow in sewer and wastewater pipelines.
2. **The only continuous real-time monitoring solution** for sewers and waste water pipelines in the world.
3. **Allows pipeline operators to not only monitor 'down shaft' spot flow**, but continuous 'in pipe' flow, level and condition.
4. **In-channel measurement** of flow depth, velocity and volume, enables real-time control so potential flooding incidents can be responded to and averted before they happen.
5. **Delivers fast-speed, secure data transfer** over a fibre network with capacity for integration of existing sensors, telemetry and smart technologies.
6. **Dual functionality of fibre** provides an additional communication network without impacting critical core pipeline infrastructure and operations.

How It Works



transformati·n

make infrastructure make sense

nuron fibre sensing technology is not 'spot' but 'continuous' in-pipe sewer monitoring with in-built networking capabilities to transform wastewater infrastructure and build smart cities of the future.

Spot Sensors

Conventional sewer monitoring uses a few hundred spot sensors spread over thousands of kilometres of sewer network, usually at manholes. Owing to the physics of free surface pipe flow, these sparse measurements give a very limited view of the network status. With the addition of wifi connectivity to transfer measurement data, spot monitors can be unreliable and unsecure.

Spot Sensors vs. nuron Continual Sensing

	nur·n make fibre make sense	Spot Monitors
Power Supply	Above ground	In sewer
Communications	Secure networking via fibre	Relies on wireless coverage
Reach	Many km	Single location
Coverage	Continuous, man-entry and non-man-entry	Access points only
Life	Maintenance free for 20+ years	5-7 year life
Data Access	Anywhere along the cable	Pre-defined locations
Measurements	Depth; velocity; flow rate; temperature; structural integrity	Different sensors usually required for different variables, but no structural monitoring

nuron Continual Sensing

nuron installs optical fibre sensors housed within a sensory containment system along the length of a sewer network. Short laser pulses are continually fired into the optical fibre sensors from one end. As the light travels, some is backscattered by imperfections in the fibre and time of flight gives location. All sewer network data is recorded by active components which reside above the surface. By analysing the backscattered light, nuron can determine flow rate, depth and temperature at all points along the fibre and in real time.

evoluti·n

make wastewater make sense

Evidence shows increasing rainfall, population and urbanisation is causing flooding and discharge from ageing and overloaded sewers. nuron helps wastewater operators address challenges and improve performance.

Your Challenges



Business Benefits

Operational



- Real-time data and control for proactive and predictive management,
- Increased capacity for networking legacy sensors, telemetry and communications,
- A fast speed fibre backbone backbone for future smart city initiatives.

Financial



- Better use of capacity and deferred expansion costs,
- Avoidance of OFWAT and environmental penalties,
- Less than 5% of the construction cost of a new sewer.

Environmental



- Address climate change and protect the environment,
- Cheaper and more environmentally friendly than building traditional networks,
- Exceptional service and peace of mind for customers.

collaborati•n

make science make sense

nuron wastewater and sewer experts have worked together to develop and patent a next generation, dual-purpose fibre sensing technology for wastewater operators and industry.

Background

nuron was formed by Mike Ainger (former Geo) and Mark Rutherford (Financial Strategy Expert) and commenced trading in 2015, bringing together their considerable experience of the utilities and telecommunication industries. The company was set up to address the need for a step change in monitoring technology for the wastewater industry, and to lead a team of bright entrepreneurs, innovators and engineering experts.

nuron's entrepreneurial management team is headed up by Claire Fenwick (centre), Managing Director, with Paul Dickenson (right) as Technical Director and Louise Keogh (left) as Commercial Manager. They combine successful careers focused on installing and running conventional communication networks, fibre networks in sewers and developing fibre optic monitoring solutions for oil and gas customers.

