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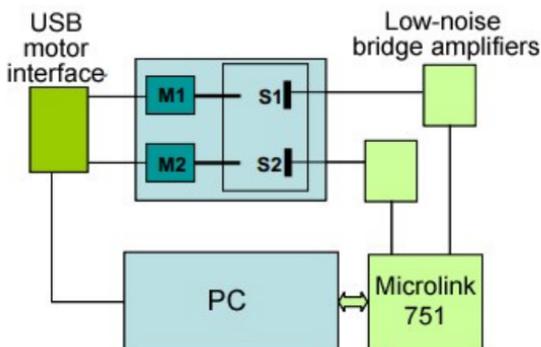
Microlink 751 helps Researchers Investigate Cell Forces

Cells exert forces on, and mechanically sense, their surrounding matrix. This mechanical probing forms the basis of a feedback system that is critical in tissue development. Researchers from Manchester University are investigating how cells quantitatively sense the mechanical state of the surrounding matrix, which is subject to external stresses much greater than the mechanical tolerances of the unprotected cell.

The scientists incorporated cell-matrix constructs into a custom-made strain-tension measurement device (a "tension stepper"). This could measure both the matrix-derived and cell-derived tension during cycles of stretch and relaxation.

The tension-stepper device monitored the tension in the cellmatrix construct over repeated strain cycles. As part of their measuring equipment, the researchers made cantilevers 0.1 mm thick, 6 mm wide and 14 mm long. They bonded pairs of strain gauges of 350 ohm resistance to the two surfaces of each cantilever.

They then connected the strain gauges to a custom-made bridge amplifier, which incorporated a low-noise pre-amplifier. The output from this was digitized and logged by a [Microlink 751](#) and Windmill software.



Block diagram of the strain measuring system

The 3D cell-matrix construct system successfully mimicked embryonic tensile tissue. The study has shown a cell-derived and well-defined re-tensioning of the relaxed tissue over repeated strain cycles. A cell-independent stress relaxation of the matrix was also observed over repeated strain cycles.

A slow, steady increase in elastic modulus was evident with prolonged strain cycling over thousands of cycles.

Further Reading

[More about the Microlink 751](#)

[Synchronized mechanical oscillations at the cell-matrix interface in the formation of tensile tissue](#). Holmes et al. Proc Natl Acad Sci U S A. 2018 Oct 2;115(40)

Your Data Acquisition Questions Answered: Fish Farming

Question

I am starting a fish farm and am interested in your monitoring program that you have installed at a [fish farm in Scotland](#). Can you give me some more details on this and a rough guide on the work you do? Would the logging system be able to link to an alarm system as well?



Monitoring tanks of fish in Scotland

Answer

We build data logging systems that would log data from the sensors you want to use, for example oxygen concentration, water flow and temperature. These could either be logged by a local PC or sent to the cloud for storage in a database and real-time monitoring over the internet.

You could connect your sensors through the [Microlink 751](#) or the [Microlink 851](#) to the Windmill software. This can then trigger an alarm when the voltage from the oxygen sensor, for instance, changes from the desired range. You would want to add some components to drive whatever alarm unit you want to use.

Read more about [aquaculture and fish farming](#), the [Microlink 751](#) and [Microlink 851](#).

DAQ News Round-up

Welcome to our round-up of the data acquisition and control news. If you would like to receive more timely DAQ news updates then follow us on [Twitter](#) - [@DataAcquisition](#) - or grab our [rss feed](#).

Sub-terahertz sensor steers driverless cars through fog

On-chip system that detects signals at sub-terahertz wavelengths could help steer driverless cars through fog and dust.

Source: MIT

<http://news.mit.edu/>

Project aims for self-powered railway track monitoring in real time

The system, which will harvest energy from vibration to the rails caused by trains passing along the line, will dramatically improve maintenance

efficiencies, and significantly reduce the cost of managing the railway infrastructure,

Source: The Engineer

<https://www.theengineer.co.uk/>

Ceramic sensor reveals aeroplane, building and bridge strain

A ceramic that becomes more electrically conductive under elastic strain and less conductive under plastic strain could lead to a new generation of sensors embedded into structures like buildings, bridges and aircraft which are able to monitor their own health.

Source: Rise University

<https://news.rice.edu/>

After 90 Years, a better way to measure the composition of paper

Using a method recently used to examine the material aging in microelectronics devices on semiconductor chips, new measurement technique can be performed in minutes and leave the entire sheet of paper intact.

Source: NIST

<https://www.nist.gov/>

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Windmill Software Ltd, PO Box 58, North District Office,
Manchester, M8 8QR, UK

Telephone: +44 (0)161 833 2782

Facsimile: +44 (0)161 833 2190

E-mail: monitor@windmillsoft.com

<http://www.windmill.co.uk/>

<https://www.windmillsoft.com/>