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Making older buildings safe

When a building is old, and sometimes if its use changes, then its concrete beams will need strengthening. This can be done by retro-fitting steel plates and post-tensioned metal straps (PTMS).

Iranian researchers are investigating how using PTMS affects the concrete's resistance to cracks and shearing. They developed a new configuration that can be applied to any beam, and used Windmill software to test it.



Beam testing machine

To measure the strain inside the concrete, straps and the reinforcing steel bars, they used two different types of strain gauges in their experiments, along with load cells and LVDTs (Linear Variable Differential Transformers). (

They applied the first one, which was 30 mm long, to the steel bars and metal straps.

The second type was 80 mm long and this they used on the concrete.

A data logger acquired all the data from the load cells, strain gauges and the LVDT (Linear Variable Differential Transformer) whilst Windmill software linked the data logger to the computer. The data logger had 9 channels for strain gauges, 4 channels for LVDTs and 2 channels for load cells.

The researchers found that their method of strengthening using PTMS increased ductility of the beams, meaning that instead of suddenly shearing they would undergo deformations without failing, making the building much safer.

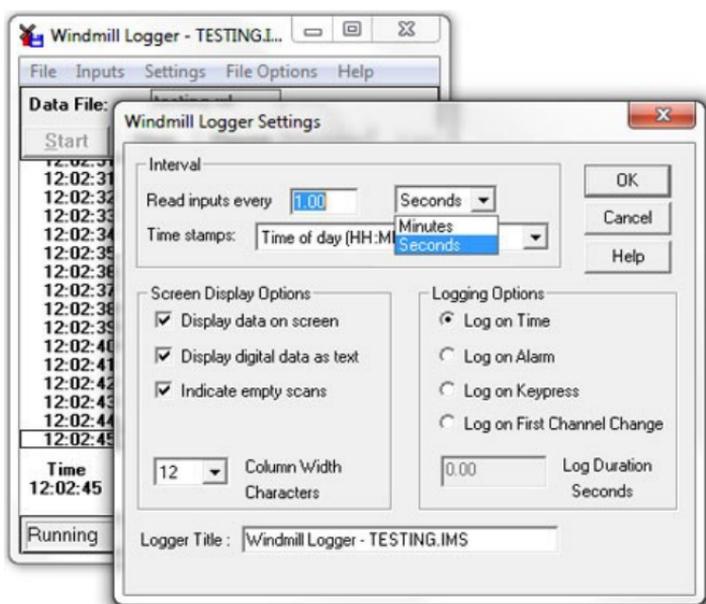
More Information

Abdullah W, Rafiq SK (2021) [Experimental Work on Shear Strengthening of Beams Using Post-Tensioned Metal Straps Wrapped Around Steel Plates Anchored to Normal Steel-Reinforced Concrete Beams](#). *Iranian Journal of Science and Technology*, Transactions of Civil Engineering

Your Data Acquisition Questions Answered: Downloading the Logging Software

Question

I have been reading your newsletters and using ComDebug for several years but the Logging software looks really useful. Is it possible to download this software? Thank you for your help!



Answer

Yes. Monitor subscribers can download Logger and the other Windmill programs for free. Just email monitor@windmillsoft.com for your copy.

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](#).

Spotting killer fruit and veg

Pesticides in fruit and vegetables kill 11,000 people every year and unintentionally poison 385 million worldwide. Monitoring these foods for microscopic chemicals and harmful bacteria can take days of sending small batches off to laboratories for testing and analysis. But now, a new detector is being developed to spot minute traces of these poisonous elements with photonics to give a result in minutes.

Source: Photonics 21

<https://www.photonics21.org/>

Novel sensor detects gas molecules

Innovative ethanol sensor combines a graphene transistor with a customized metal-organic coating. It represents the prototype of an entirely new class of sensors.

Source: University of Texas Arlington

<https://www.uta.edu/>

Monolayer strain sensor sets new record

A new atomically-thick strain sensor is 100 times more sensitive than commercial devices and 10 times more sensitive than alternative versions based on graphene.

Source: Physics World

<https://physicsworld.com/>

Tiny sensor inspired by wind-born seeds monitors environment

A winged microchip is the smallest-ever human-made flying structure. The size of a grain of sand, dispersed microfliers could monitor air pollution, airborne disease and environmental contamination

Source: Northwestern University

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

Simplified sensor measures tilt angle and direction with liquid

Conventional tilt sensors consist of sub-sensors to measure acceleration and angular rate against the vibrations of the host object like an aeroplane. Breakthrough liquid sensor simplifies everything.

Source: Eureka Alert

<https://www.eurekalert.org/>

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