

Kinergizer provides evopro with a solution to power railtrack monitoring devices

Field testing in Hungary proves the concept of harvesting energy from the rail track

The Challenge

Wireless rail temperature measurement systems consume battery life within a few years and require railway maintenance personnel to track and replace batteries frequently in the field.

What is happening on the track?

Rail track temperature measurement is common within the railway sector to provide early warning of unsafe conditions. The current solutions to measure track temperature are battery powered devices which have a fixed life which is dependent on how often the temperature is sensed and transmitted.

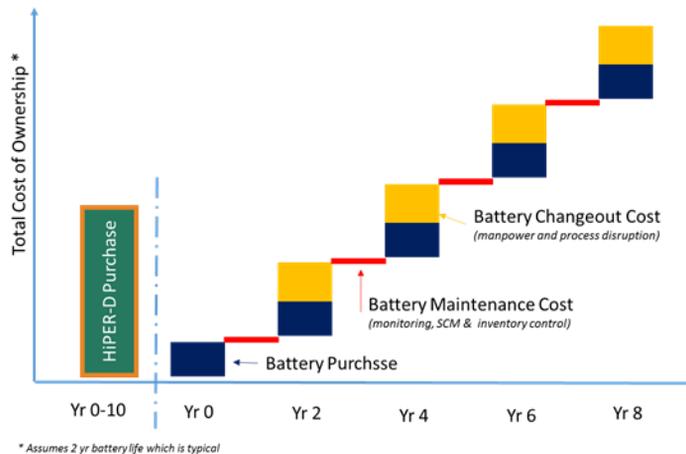
The eRTM rail temperature measurement system from evopro has integrated the most advanced measurement and telecommunication technologies to create an industry leading battery powered wireless sensor. The system can last for 1-3 years between battery replacements after which time maintenance personnel must remove the device and replace the battery. As part of evopro's ongoing product innovation, field testing was carried out to evaluate the integration of HiPER-D energy harvesting from Kinergizer into the next generation of eRTM.

Why Energy Harvesting?

The use of energy harvesting in wireless sensor applications will reduce the total cost of ownership over the lifetime of the sensor. This saving comes from elimination of maintenance and battery replacement as illustrated below.

The Solution

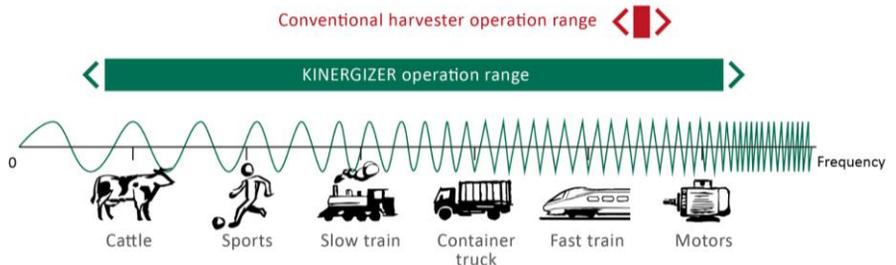
HiPER-D motion energy harvester converts track vibration from passing trains, into useful electrical energy to recharge a battery, thus extending the battery life and reducing maintenance costs.



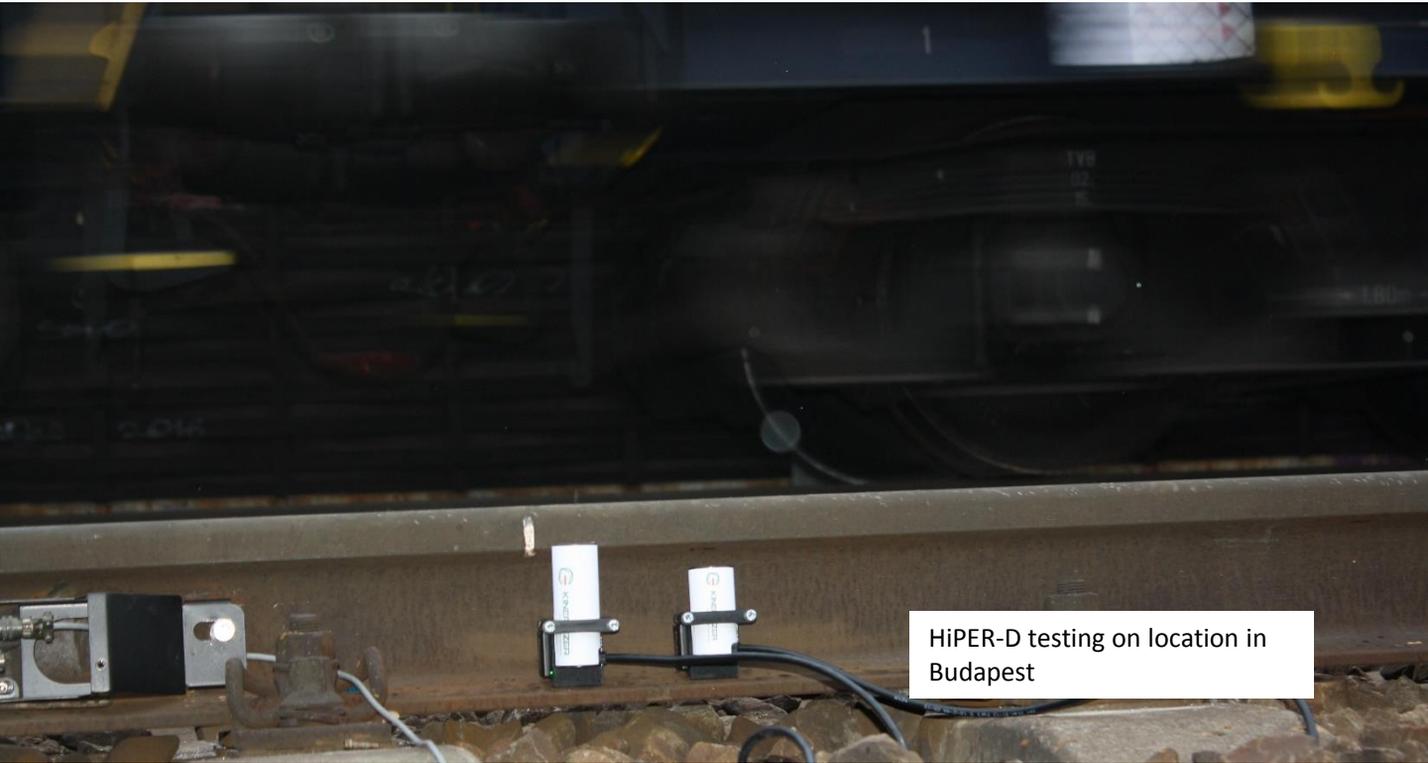
The Results

The HiPER-D device was tested with evopro on location in Budapest over two days. The power generated from passing trains has the potential to power future sensing devices.

The HiPER-D motion energy harvester from Kinergizer offers a solution to the battery life problem by converting the vibration from passing trains into electrical energy to either power the sensor or recharge the battery. The device is ideally suited for the rail application as it can harvest energy from a wide range of vibration frequencies.



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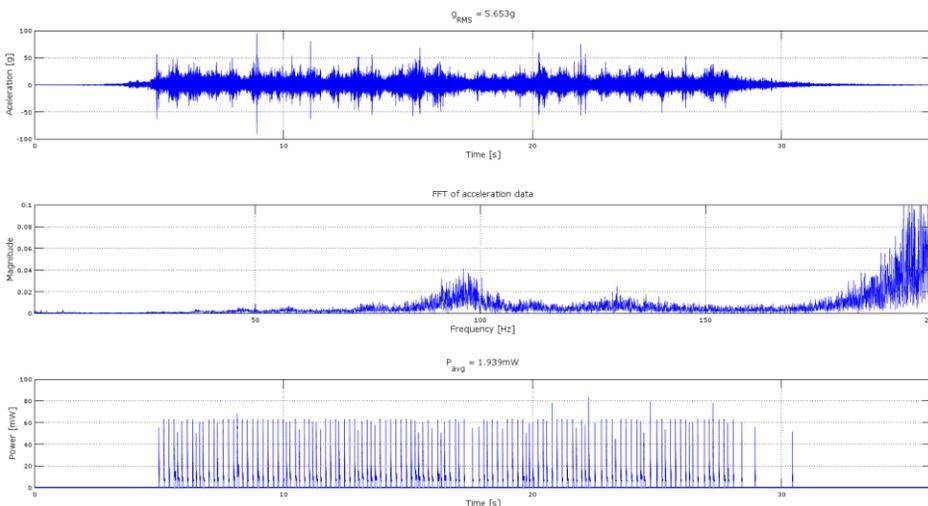


The HiPER-D energy harvester was mounted on the lower flange of the track and the electrical power generated from passing trains was measured over a fixed resistance load.

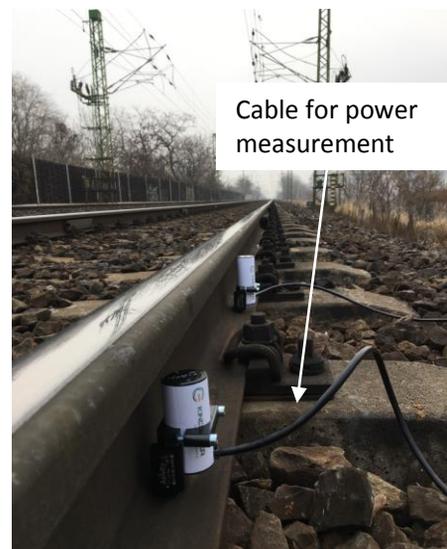
As seen in the plot below the accelerations on the track are in the range 5g rms from passing freight trains.

Even though a large portion of the vibration is outside the harvester range i.e >150Hz, the device is still able to scavenge +/- 2mW of power from the passing trains.

These results give great incentive to explore future opportunities to integrate HiPER-D in track monitoring applications.



Example of results



HiPER-D on Location