

A high-speed train with a red and grey livery is crossing a large stone viaduct with multiple arches. The train is moving away from the viewer. The background features a dramatic mountain landscape with steep, rocky slopes, dense green forests, and snow-capped peaks under a cloudy sky. The overall tone is dark and atmospheric.

VIEZO POWERAIL

There is an increased demand in the railway industry for safety and innovation to achieve an improved service. Viezo, a leading player in the market with the vibration energy harvester, offers a wide variety of solutions to your business that enables a simple, effortless, and convenient user experience of condition-based maintenance saving up to 15% of total maintenance costs.

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POWERAIL SOLUTION



WAGON LOCATION



BEARING HEALTH



FLAT SPOTS



HIGHLY INNOVATIVE & COMPETITIVE

The core know-how of Viezo is a patent-pending vibration energy harvesting technology, which converts vibrations into electricity to power sensors and is embedded in the hardware of **Powerail** to make the solution maintenance-free and make sensors live longer than the current available solutions.

Vibration energy harvester is based on a unique piezoelectric PVDF polymer material, which is inexpensive and environmentally-friendly at the same time. Together with the harvester goes the supercapacitor to store all the generated electricity and distribute it efficiently to the sensor.

YOUR WAGONS ARE IN GOOD HANDS!

Powerail is a cost-effective and safety-oriented solution developed by Viezo to help wagon owners reduce the maintenance costs, avoid derailments and increase their wagon availability.

Solution is based on monitoring the axlebox bearing health, detecting the flat spots on the wheels, and GPS-locating of wagons.

ARCHITECTURE

8x sensors

1x gateway

HOW DOES IT WORK?



DATA MEASUREMENT AND SHARING

Vibration and temperature data is being measured every specific range of time, standardly every 1 hour. Smart firmware algorithm makes the sensor do the measurements at as similar situations as possible (same cruising speed of wagon) in order to compare the data much more accurately. Each sensor then shares complete frequency spectrogram to the gateway.

Gateway collects each measurement data from sensors via BLE (Bluetooth low energy) network immediately after the measurement is taken, then locates the wagon using GPS (once per hour) and shares the complete data package to the cloud via widely available LTE connectivity.

CLOUD SOFTWARE

Cloud-based software will accompany the mentioned critical hardware, where all collected data will be presented in a convenient and user-friendly way. The earliest versions of software will be able to showcase the data for your analytics team to decide on whether any maintenance is required. With time, it is bound to evolve into complete predictive maintenance machine, making own weighted decisions.

COMPLETE AUTONOMY

All provided hardware (Sensors and Gateway) have various energy harvesting possibilities which significantly increase the lifetime of the hardware without any maintenance checks, charging or any other headaches. Whole system is designed to work maintenance-free for at least 10 years.

OUR UNIQUE HARDWARE

SENSOR

Powerail Sensor is an autonomous wireless Vibration & Temperature sensor powered by vibration energy harvester. Sensor is designed to be installed in the closest point to the bearing in order to collect the most accurate data about bearings' health. It is done through gathering the most important vibration and temperature data to support the evidence of potential bearing failures and flat spots.

Main Characteristics:

- Fast and reliable installation on the axlebox
- Maintenance-free and autonomous
- BLE communication with the Gateway

| Sensors | Vibration | Temperature |
|-----------------------|----------------------------|---------------|
| Measurement Range | 0-16g | - 40°C ~ 85°C |
| Resolution | 0,488 (16g scale) | 8-bit |
| Accuracy | ±0,001g | ±1°C |
| Energy Storage | Supercapacitor 100F; 3.8V | |
| Communication | BLE (Bluetooth low energy) | |
| Longevity | >10 years | |
| IP Rating | IP65 | |
| Operating Temperature | -30°C ~ +80°C | |



GATEWAY

Powerail Gateway is an autonomous wireless device, which concentrates the data from all eight sensors on the same wagon, locates the wagon and shares the acquired data to the cloud server. It is powered by efficient solar panel and equipped within a solid rechargeable battery to remain maintenance-free for years.

Main Characteristics:

- Powered by embedded solar panel, within the rechargeable battery inside
- Estimated lifetime is >10 years, matching the lifetime of sensors
- LTE communication with the cloud server

FEATURES

CONDITION-BASED MONITORING

Sensors equipped on each axlebox will share the bearing and wheel condition data to the cloud; therefore, empowering the maintenance based on condition of the asset.

REDUCED DOWNTIME, DELAYS

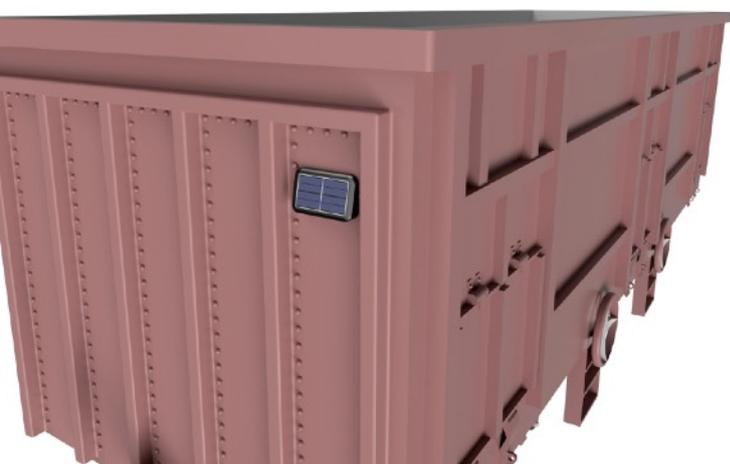
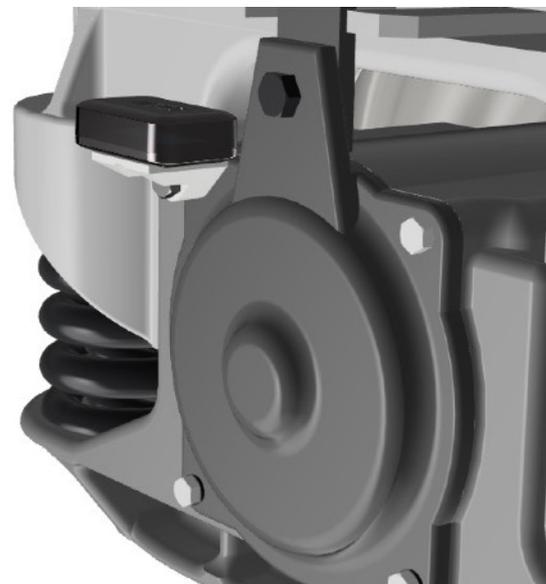
The proper timely monitoring with the help of the sensors results in preventing downtime and delays of the trainsets.

REDUCED UNNECESSARY MAINTENANCE COSTS

Costs resulted from the routine physical trips to check and maintain the bearings and wheels can be reduced significantly, since all necessary data will be available online.

FAST AND RELIABLE INSTALLATION

Each sensor installed in less than 2 minutes by unscrewing one bolt and screwing it back with sensor. Gateway installation shall take up to 15 minutes to rivet on the side of the wagon.



REMOTE EDGE MANAGEMENT

Over-the-air updates and configuration of sensors and gateways enable continuous performance at the highest level.

KEEP DATA SECURE

Sensors and gateway are using full end-to-end encryption; therefore, only the owner of the device will have access to the shared data.

PROLONGED LIFETIME

Various energy harvesting methods, combined with incredibly smart ultra-low-power algorithms allow **Powerail** solution to work much longer than regular battery-powered hardware.

INTEGRATION WITH YOUR SOFTWARE

Data can be easily shared with your software through MQTT; REST API; GraphQL or other integration.

PROCEED WITH YOUR ORDER

CONTACT

One thing faster than our installation process is our response time. Have questions?
Contact us by email, phone or LinkedIn.

ORDER

Let's agree on the quantity of wagons you want to test, location, software integration, payment terms, length of trial and we will take care of the rest.

START

First customers' pre-orders will be installed in January of 2022. Pre-order now for 50% of the total price. Pay the rest after the installation is complete.



CONTACT OUR BUSINESS DEVELOPMENT TEAM

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