Problem statement:

Currently Tire Pressure Monitoring System or TPMS run on the non-rechargeable Li-ion batteries which cannot be removed from the TPMS device. In case battery/batteries run out, the entire TPMS device needs to be replaced. If a TPMS device on one of the wheels of the car malfunctions there is a high probability that the other TPMS devices might malfunction too. And replacing all four devices can turn out to be expensive.

Proposed Solution:

My solution is I’m trying to utilize the rotational motion of the wheel to generate sufficient amount of electric current so as to measure tire pressure and send it to an ECU of the vehicle. A weighted disc which is allowed to rotate freely is connected to a circular spring. Due to the rotating wheel, the disc rotates and through the mechanism of gears and ultimately winds the spring. The spring will keep winding up to a certain limit after which it is suddenly released and again starts to rewind due to the continuous rotation of the disc. The energy that the spring periodically is instantly converted into electrical energy which powers the tire pressure sensor and using the energy the sensor transmits the data to the ECU of the car.

