

# ZF Presents Another Smart Solution –



## To monitor the fuel filler cap against external impacts

Fuel theft can become a serious problem for truck, bus, or construction vehicle fleet operators. Thanks to the ZF battery-free and wireless radio switch technology, it is possible to monitor the fuel filler caps reliably and automatically of the corresponding vehicles. If any unpermitted openings happen, the system alarms.

### The technological principle:

The ZF radio switch converts the kinetic energy by mechanical actuation of the switch into a voltage pulse by means of induction. This voltage pulse is enough to reliably transmit RF commands via commercially available radio protocols such as EnOcean3.0, ZigBee Green Power or BLE5.0. The radio switch is therefore free of any external power sources, batteries, or wires.

### The advantages:

- Flexibility in application design – no cables necessary
- Long lifetime (1,000,000 switching cycles) and no batteries – no maintenance necessary
- Compact design (20.1 x 7.3 x 14.3 mm) – for applications with limited space
- Compatible with commercially available standard protocols (EnOcean3.0, BLE5.0, ZigBee)

### Application example: Monitoring fuel filler cap

The energy harvesting switch can be integrated directly into the plastic housing of the fuel filler cap for trucks, buses or construction vehicles. The compact design of the radio switch favors its use. By unscrewing the tank cap, the ZF radio switch is activated mechanically and generates enough energy to send a BLE5.0 radio signal. As soon as a signal is triggered, it can be received by a GPS device or a central unit in the vehicle's cockpit. The data, coupled with the time and location, can be transferred from the vehicles unit to the fleet management system or directly to the vehicle driver's smartphone. In this way, the smart system can immediately warn against unauthorized opening of the fuel filler cap and possible fuel theft. Due to the wireless and battery-free transmitter, vehicles can be retrofitted without cabling. High costs for battery changes or cable breaks can be avoided.

*Anti-tamper application for vehicle fuel caps*



*Vehicle fleet operators using ZF energy harvesting switch*

