RF Switch for Bikes

No Batteries, No cables

Connectivity does not only play a central role in road vehicles but it is also a must-have for bikes and pedelecs. Training and navigation data are conveniently exchanged between the on-board computer and a smartphone via Bluetooth Low Energy 5.0. Additional control elements can be easily integrated into the Bluetooth system with the help of the ZF energy harvesting radio switch:It could be for gear shift, lights or seat post control. All of this is possible without additional cabling and without the use of batteries.

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 protocols like the Bluetooth Low Energy 5.0. The radio switch is therefore free of any external power sources, batteries, or wires.

The advantages:

- Flexibility in application design – no cables necessary
- No batteries and very long lifetime (1,000,000 switching cycles) – no maintenance necessary
- Compact design (20.1 x 7.3 x 14.3 mm) – for applications with limited space
- Compatible with the RF protocol Bluetooth Low Energy 5.0

Application example: Bike control elements

Depending on which function is to be operated on the Bike, there are different versions of switches that are attached to the steering wheel. Whether controlling gears, seat posts or lights, the key component integrated in the switch is always the same: the compact energy generator from ZF. The actuation of the control element automatically leads to the actuation of the generator, which converts the kinetic energy into a voltage pulse and thereby transmits a corresponding Bluetooth signal to a compatible receiver module. The unique assignment of functions is guaranteed by the unique ID of each transmitter. Annoying cabling, broken cables as well as battery failures and battery changes can be cleverly avoided.

Bike control elements using ZF switch

ZF energy harvesting generator

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Find more information about energy harvesting from ZF here: https://switches-sensors.zf.com/energy-harvesting/