



Off-Road and Recreational Vehicle Switching Solutions

Control solutions for dashboard and drivetrain applications

TW Switches

OFF-ROAD AND RECREATIONAL VEHICLE SWITCHING SOLUTIONS

Off-Road and recreational vehicles require rugged, quality products to ensure reliable operation in the field and ITW Switches are a proven solution for their switching and sensing needs.

ITW Switch's Pushbutton and Microswitches are designed for use in dashboard and drivetrain applications, places where you require operation-critical solutions whilst our Sensor technology acquires a physical quantity & converts it into an electrical signal suitable for processing.

TECHNOLOGIES

- Resistive Elements (Polymer Thick Film [PTF] > Printed Circuit Board [PCB])
- Pulse Width Modulation (PWM) Data Feedback
- Capacitive
- Inductive
- Magnetic (Hall-effect, Reed)
- Electromagnetic
- Optical

APPLICATIONS

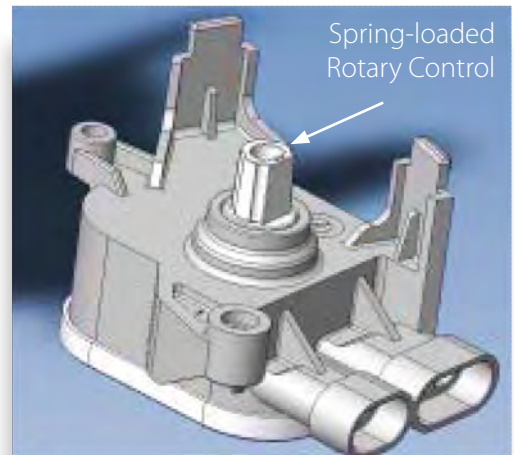
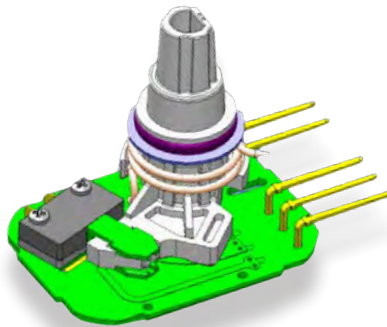
- Linear Position
- 360° Rotary Position (i.e. Gear Position, Throttle, etc.)
- Operator Presence
- Material Detection
- Speed
- Proximity/Position
- Start/Stop Pushbutton
- Potentiometer



Accelerator Module with wiper/PCB Control

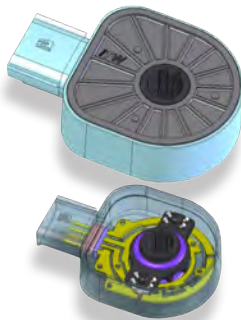
- Function: Controls vehicle throttle
- Markets where used: Transportation, Heavy Transportation & Industrial

Polymer Thick Film (PTF) controlled PCB

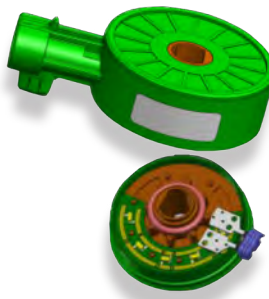


Gear Position Indicators (Park, Reverse, Neutral, Drive, Low)

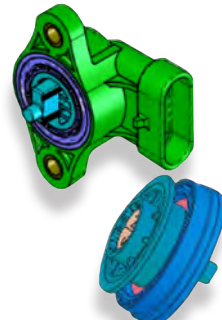
- Controls vehicle transmission, provides 360 degree compatible gear indication
- Markets where used: Heavy Transportation, ATV & Off-Highway vehicle



Lead-frame controlled



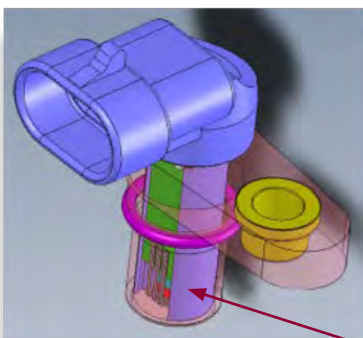
Printed Circuit Board with actuation points control



Hall-effect Sensing (magnetic)

Hall-Effect Sensor (Zero Speed, High Accuracy Gear Tooth Speed Sensor)

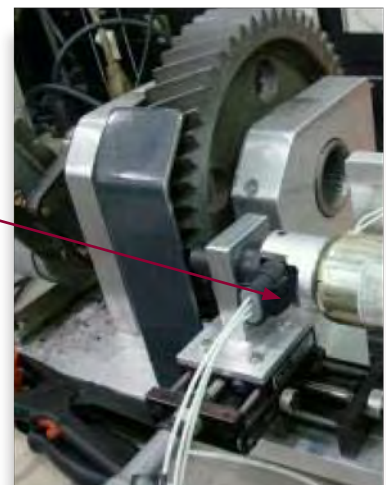
- Providing feedback for Speed & Direction Sensing
- Markets where used: ATV's, UTV's, Side-by-Sides, Industrial & Off-Highway Vehicles



PCB Controlled



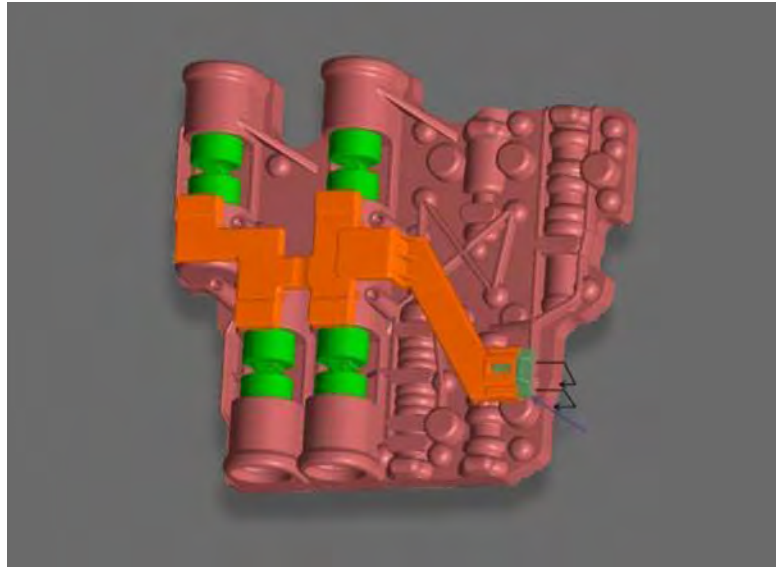
Hall-effect chip



OFF-ROAD AND RECREATIONAL VEHICLE SWITCHING SOLUTIONS

Linear Position Sensor Application (Automotive clutch / transmission)

- Function: Senses the linear position of transmission components
- Markets where used: Automotive, Transportation, Heavy Transportation



Console Controls (Start/Stop, Gear Selection, Horn)

- Actuator for Gear Selection, Start/Stop, Battery Pack On/Off, Horn
- Market where used: eBike, ATV, Off-Road Vehicles

Gear Selection



Battery Pack On/Off



Start/Stop

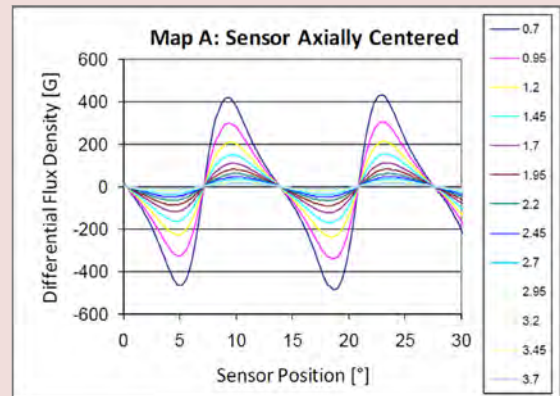


Bell / Horn



Specialised Magnetic Sensor Design

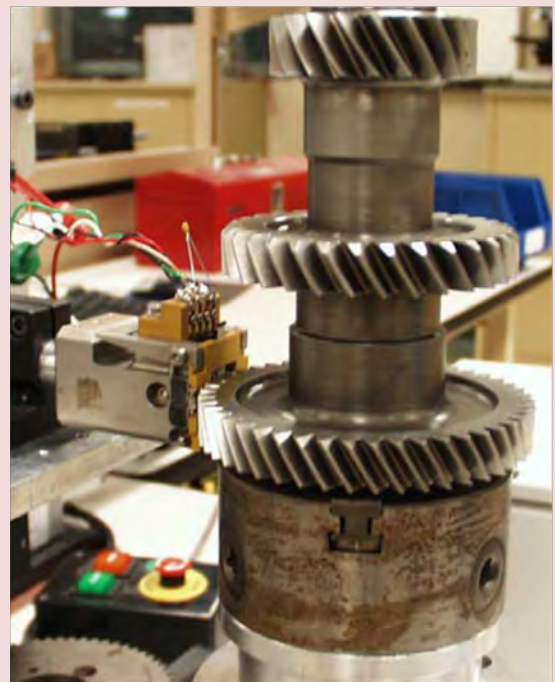
- Magnetic field mapping of ferrous target
- Refine sensor characteristics based on application:
 - Frequency (RPM)
 - Air gap
 - Target geometry
 - Mounting orientation
- Custom magnet & concentrator design
 - Maximize magnetic field for improved air gap, etc.



DIFFERENT HALL-EFFECT SENSOR DESIGNS

Continuous Output Hall-Effect Sensor

- Output: .5V => 4.5 V
- Number of wires: 3 min.
- Rotation angle: Up to 359°
- Design flexibility: Full flexibility of start point and range
- Safety: Single or redundant/ independent outputs
- Advantages: Fully designed and tested.
- Market where used: eBike, ATV, Off-Road Vehicles



5 independent Hall-Effect switches, surface-mounted on stationary PCB, magnet mounted on rotor

- Output: Different value resistive
- Number of wires: 3
- Rotation angle: Up to 360°
- Design Flexibility: Full flexibility for only the cost of new PCB artwork
- Disadvantages: System not designed yet

Wireless communication with vehicle controller to indicate gear position

- Output: Data/frequency streaming
- Advantages: Does not need Harness, could run on battery
- Disadvantages: Trigger system not designed yet



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