TE Connectivity’s SENSOR TECHNOLOGIES for the Automotive Industry
TE Connectivity (TE) is one of the largest sensor companies in the world, with innovative sensor solutions that help customers transform concepts into smart, connected creations. To transport passengers safely and efficiently, vehicles need data. Today’s cars can sense and respond to changing conditions, inside and out.

TE sensors help provide the data for control, adaptation and response of vehicle functions that increase safety, comfort, and efficiency. Our technology is an integral part of many modern nervous systems in vehicles.

### ENGINE/E-MOTOR

Our engine and e-motor sensors are used in vehicle applications such as travel sensor for turbo charger actuator, pneumatic (EGR) Cylinder, CAM and Crank Shaft Speed sensors and resolvers for e-motor commutation.

### EXHAUST

TE provides a range of sensors for exhaust gas applications, such as urea quality, level and temperature, urea pump pressure and exhaust gas temperature (EGTS). These sensors help the OEM to comply with the latest emission regulations and significant performance improvement of modern aftertreatment systems.

### CHASSIS

We provide a range of chassis solutions for roof and convertible switches, actuator and cylinder position, seat position and weight classification. Our humidity and temperature technologies are used in Heating, Ventilation and Air Conditioning (HVAC) systems to prevent wind screen fogging and for energy management.
TE Connectivity is committed to making cars safer, greener and more connected. We support this commitment by integrating innovative sensors in demanding application areas such as automated transmissions, engines, clutch, brake and other mission critical areas.

Our sensors are designed and manufactured to exacting specifications, often on a custom basis. Together with our customers, we are working to solve today’s biggest application challenges in new and creative ways.

**BRAKE**

Our brake sensors are used in vehicle applications such as travel sensor for brake master cylinder position (optional redundancy), travel sensor for rear axle steering, rotary sensor for brake pedal position detection (optional redundancy); contactless brake light switch and wheel speed sensor. We also provide pressure sensors such as the vacuum brake booster sensor and brake line pressure for ABS/ESC modules.

**TRANSMISSION**

TE’s transmission sensors are used in vehicle applications such as all gear/neutral detection for manual transmission (MT) to support start and stop function, drive mode (travel or rotary) for automatic (AT), continuously variable (CVT), or dual clutch (DCT) transmissions. We also provide pressure and temperature solutions.

**CLUTCH**

The clutch sensors are used in vehicle applications such as Permanent-magnetic Linear Contactless Displacement (PLCD) sensors for concentric slave cylinder and clutch slave cylinder, rotary sensors for clutch pedal position detection; contactless switch for clutch master cylinder and travel sensor for clutch master cylinder and Dual Clutch Transmission (DCT).
Our chassis sensors are used in vehicle applications such as travel sensors for rear axle steering, wheel speed sensors for advanced Electronic Stability Program (ESP), steering angle position sensors, seat track position sensors and hall switches for position detection.

**Position**
- Rear Axle Steering
- Seat Position
- Chassis Switch
- Convertible Roof
- Fluid Level

**Pressure**
- Fuel Pump (Low Pressure)
- Power Steering
- Weight Classification
- Impact
- HVAC Fluid *

**Temperature**
- Fuel Temperature
- Passenger Cabin
- Ambient Air / HVAC
- Seat Heater
- Battery Management

**Humidity**
- Ambient
- Cabin
- Fog / Moisture
- HVAC
- EV Battery Management

* in development
**Chassis Sensors**

**Seat Track Position Custom Sensor**

- **Industry**: Automotive
- **Application**: Measure position of seat track
- **Functions**: Input for dual stage airbags
- **Technology**: Hall Switch (magnet integrated in sensor)
- **Features**:
  - Non-contact switch triggered by seat track or ferrous target
  - No moving magnets
  - Custom package size and sensor mounting
  - Optional bushing
  - Operating temperature: -40°C to +85°C

**Seat Track Position Platform Sensor**

- **Industry**: Automotive
- **Application**: Measure position of seat track
- **Functions**: Input for dual stage airbags
- **Technology**: Hall Switch (magnet integrated in sensor)
- **Features**:
  - Non-contact switch triggered by seat track or ferrous target
  - No moving magnets
  - Small package size
  - Operating temperature: -40°C to +85°C

**H2TG/D Defogging Sensor**

- **Industry**: Automotive
- **Application**: Cabin energy management and defogging (HVAC)
- **Functions**: Measuring dew point and windshield temperature measurement
- **Technology**: Capacitive and NTC
- **Features**:
  - Humidity range: 0% RH to 100% RH
  - Temperature range: -40°C ... +125°C
  - Calibration: ± 1.5° DP at 10°C, ± 0.8° C at 25°C
  - Operating voltage: 12 V
  - Analog or digital (LIN) output

**Coreless Current Sensor**

- **Industry**: Automotive
- **Application**: Battery Pack (BDU: Battery Disconnect Unit)
  Battery Management for xEV application
- **Functions**: Measuring current of battery
- **Technology**: Hall
- **Features**:
  - Operating voltage: 5 V (4.5 to 5.5 V)
  - Operating temperature: -40°C to +85°C
  - Operating current range: -350 A ... +350 A
  - Analog output
  - Accuracy @ 25°C: 1% (Hall)
### Integrated Current Sensor

**Industry**  
Automotive

**Application**  
Battery Pack (BDU: Battery Disconnect Unit)
Battery Management for xEV application

**Functions**  
Measuring current of battery

**Technology**  
Hall or Shunt

**Features**  
- Operating voltage: 5 V (4.5 to 5.5 V)
- Operating temperature: -40°C ... +85°C
- Operating current range: -350 A ... +350 A
- Analog output
- Accuracy @ 25°C: 1% (Hall)
- Tolerance: 100 µΩ ± 5%
- Temperature sensor: NTC

### Cylinder Hall Switch

**Industry**  
Automotive

**Application**  
Hydraulic cylinder for convertible roofs

**Functions**  
Measuring piston position of hydraulic cylinder

**Technology**  
Hall Switch (magnet integrated in sensor)

**Features**  
- No moving magnet inside cylinder
- Small and robust design
- Pigtail with flexible connector interface

### Hall Switch Cable Assemblies

**Industry**  
Automotive

**Application**  
Convertible roof systems

**Functions**  
Digital position detection

**Technology**  
Hall Switch (magnet integrated in sensor)

**Features**  
- Variety of cable assembly with integrated Hall switches

### Roof Sensor

**Industry**  
Automotive

**Application**  
Roof railing detection

**Functions**  
Adaptive ESP support

**Technology**  
Hall (moving magnet)

**Features**  
- Current interface
- Small geometry
- Diagnostics ability due to two-wire interface
### Seat Buckle Switch

<table>
<thead>
<tr>
<th>Industry</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Airbag</td>
</tr>
<tr>
<td>Functions</td>
<td>Detecting buckle up status</td>
</tr>
<tr>
<td>Technology</td>
<td>Hall Switch (magnet integrated in sensor)</td>
</tr>
</tbody>
</table>
| Features       | • Non-contact measurement  
|                 | • Small design      |

### Steering Position Sensor

<table>
<thead>
<tr>
<th>Industry</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Steering / Attention Assistant</td>
</tr>
<tr>
<td>Functions</td>
<td>Measuring steering angle</td>
</tr>
<tr>
<td>Technology</td>
<td>Hall (moving magnet)</td>
</tr>
</tbody>
</table>
| Features       | • Non-contact measurement  
|                 | • High resolution of steering angle (single turn)  
|                 | • Adapted to actuator motor |

### Truck Rear Axle Steering Sensor

<table>
<thead>
<tr>
<th>Industry</th>
<th>Industrial &amp; Commercial Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Truck Rear Axle Steering</td>
</tr>
<tr>
<td>Functions</td>
<td>Measuring piston position of Hydraulic Steering Cylinder</td>
</tr>
<tr>
<td>Technology</td>
<td>Active PLCD (moving magnet)</td>
</tr>
</tbody>
</table>
| Features       | • Non-contact measurement through cylinder wall  
|                 | • Robust design                               
|                 | • Truck specific connector interface         |

### Weight Sensor

<table>
<thead>
<tr>
<th>Industry</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Passenger detection</td>
</tr>
<tr>
<td>Functions</td>
<td>Measuring seat weight to classify passenger for airbag deployment</td>
</tr>
<tr>
<td>Technology</td>
<td>Strain gage technology</td>
</tr>
</tbody>
</table>
| Features       | • High resolution of weight  
|                 | • Very small package (integration to seat track)  
|                 | • Sensor array with ECU for in system calibration  
|                 | • Mechanical overload protection  
|                 | • Very robust design                  |
## P-SIS Side Impact Sensor

<table>
<thead>
<tr>
<th>Industry</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td>Side impact detection</td>
</tr>
<tr>
<td><strong>Functions</strong></td>
<td>Measuring the quick increase of pressure within the cavities of passenger car door to determine the airbag deployment</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>MEMS</td>
</tr>
</tbody>
</table>
| **Features** | • Small package and robust design  
                   • PAS4 data transmission mode |

## FIS / Z-Fis Front Impact Sensor

<table>
<thead>
<tr>
<th>Industry</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td>Front impact detection</td>
</tr>
<tr>
<td><strong>Functions</strong></td>
<td>Measuring acceleration data for front impact detection</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>MEMS</td>
</tr>
</tbody>
</table>
| **Features** | • Small package and robust design  
                   • PSIS-A data transmission mode |

## Seat Track Position Sensor – Option 3

<table>
<thead>
<tr>
<th>Industry</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td>Dual staged airbag</td>
</tr>
<tr>
<td><strong>Functions</strong></td>
<td>Measuring seat track position</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>Hall Switch (magnet integrated in sensor)</td>
</tr>
</tbody>
</table>
| **Features** | • Triggered by seat track (no moving magnet)  
                   • Current interface  
                   • Small geometry  
                   • Diagnostics ability due to two-wire interface |

## Current Sensor for BMS

<table>
<thead>
<tr>
<th>Industry</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td>Current sensing for Battery Management System (BMS)</td>
</tr>
<tr>
<td><strong>Functions</strong></td>
<td>Indicates the real-time current flowing through the battery, which would be used to calculate the “start of charge” of the battery</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>Fluxgate</td>
</tr>
</tbody>
</table>
| **Features** | • Operating voltage: ±12 V or 0-12 V  
                   • Operating temperature: -40°C to +85°C  
                   • Operating current range: 0 - 300 A  
                   • Analog and digital (SENT) output: current output or analog output  
                   • Accuracy @ room temperature: 1% |