

TE Connectivity (TE)

Sensor Solutions Overview



EVERY CONNECTION COUNTS



OUR PURPOSE

WE CREATE A
SAFER, SUSTAINABLE,
PRODUCTIVE AND
CONNECTED FUTURE.



ADVANCING THE
FUTURE OF
TRANSPORTATION



MAKING
FACTORIES & HOMES
SMARTER



ENABLING GLOBAL
COMMUNICATION
NETWORKS



REVOLUTIONIZING
MEDICAL TECHNOLOGY



CONNECTING THE WORLD

220B

PRODUCTS MANUFACTURED ANNUALLY

\$1.8B

COMMUNICATIONS
Appliances, Data & Devices

\$14B
FY18 SALES

\$3.9B

INDUSTRIAL
Industrial, Aerospace,
Defense & Marine,
Medical, Energy

\$8.3B

TRANSPORTATION
Automotive, Industrial &
Commercial Transportation, Sensors,
Application
Tooling



GLOBAL PRESENCE

PARTNERING WITH CUSTOMERS IN

140 COUNTRIES

	MANUFACTURING SITES	EMPLOYEES
AMERICAS	38	25,000
EMEA	44	30,000
APAC	22	25,000



A World Leader in Connectivity



75+ YEARS
**LEADING IN
CONNECTIVITY**

AMP
DEUTSCH
Intercontec

Creganna Medical
Entrellec
Raychem

**TRACK RECORD OF
RELIABILITY**

87%

of FY18 sales in Harsh
Environment Applications

**UNMATCHED
RANGE OF
SENSORS**

Fluid Properties	Humidity
Photo Optic	Piezo Film
Position	Pressure
Temperature	Vibration/Force

Leading in Innovation



15K+

PATENTS
granted or pending

\$680M+

INVESTED in Engineering,
Research & Development

8K+

ENGINEERS
globally

20%

of sales from new
products

All figures from FY18

Creating Value for Our Customers



THE TE OPERATING ADVANTAGE (TEOA) PROVIDES VALUE TO CUSTOMERS BY OPTIMIZING:



QUALITY



SERVICE



DELIVERY



CUSTOMER SUPPORT

Living Our Purpose and Values



\$4.75M

GLOBAL CHARITABLE
GIVING FY17

26,000

GLOBAL EMPLOYEE
VOLUNTEER HOURS FY17

\$3.6B

LOCAL ECONOMIC IMPACT FROM
SUPPLY CHAIN FY17



**GREENHOUSE
GAS EMISSIONS**
FY17 VS FY10



WATER USAGE
FY17 VS FY10



Unleashing Our Global Talent



We are committed to a safe, diverse and inclusive work environment where creativity, collaboration and innovation flourish.

THE WALL STREET JOURNAL.

MANAGEMENT TOP
250 - THE BEST
MANAGED PUBLIC
COMPANIES



HRC BEST PLACES
TO WORK FOR
LGBTQ EQUALITY IN
US AND MEXICO

OUR CORE VALUES

INTEGRITY
ACCOUNTABILITY
TEAMWORK
INNOVATION

Sensing & Connecting Data, Power, Signal...

INTEGRATED SOLUTIONS

Markets

- Automotive
- Aerospace & Defense
- Medical
- Appliances
- Industrial Transportation
- Oil & Gas
- Industrial
- Consumer Devices

Providing Unique Benefits

- Cost Efficiencies
- Smarter Technologies
- Compact Footprints
- Better Systems

Product Attributes

- Innovative Design
- High-quality
- Real-time Intelligence
- Advanced Analytics
- Rugged & Reliable

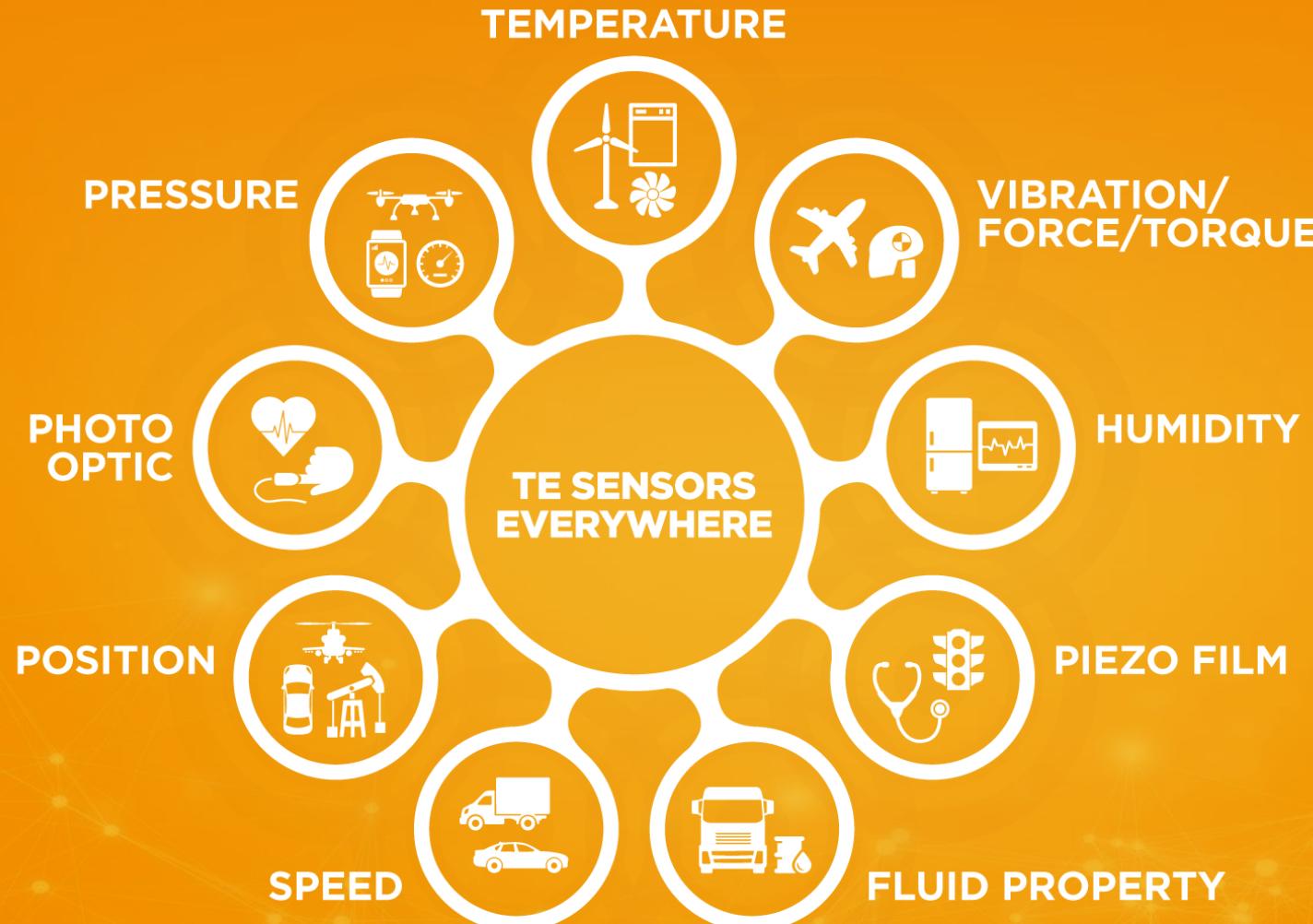
Sensors Are Making Business Better



- Streamlined data provides better business intelligence
- Size, weight, cost reductions enable broader uses in more applications
- Integrated functionalities for smarter sensing with less infrastructure
- Resistance to harsh environments for reliable, accurate monitoring

A World Leader in Sensors

TE HAS AN UNMATCHED RANGE OF SENSOR TECHNOLOGIES



Sensing Global Innovation



- Leverage data, power, and signal across digital ecosystems
- Shared data improves intelligence
- Smarter cities, safer transport and healthier lifestyles



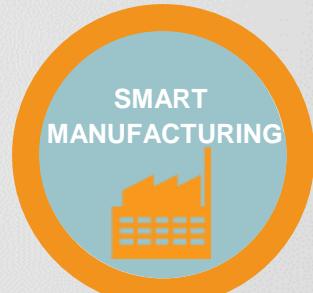
- Advancing levels of safety from the ocean floor to our daily lives and even into space
- Increasing reliability across life critical industries
- Continued operation in harsh environments



- Improved levels of productivity and economy through advanced analytics
- Real-time intelligence for smarter decisions
- New business models anticipate customer needs



- Efficient operations reduce carbon footprints from vehicles and factories
- Consumer cost savings through home energy management systems (HEMS)
- Streamlined utility consumption for improved resource management



- Increased business process efficiency
- Limit downtime of equipment
- Self-monitoring of control systems



Industries & Solutions

INNOVATIVE SENSOR SOLUTIONS THAT HELP CUSTOMERS
TRANSFORM CONCEPTS INTO SMART, CONNECTED CREATIONS



AEROSPACE
& DEFENCE

AUTOMATION
& CONTROL

DATA & DEVICES

INDUSTRIAL &
COMMERCIAL
TRANSPORTATION

MEDICAL

TEST &
MEASUREMENT

APPLIANCES

AUTOMOTIVE

INDUSTRIAL

INTELLIGENT
BUILDINGS

OIL & GAS

Sensors Global Footprint

UNMATCHED RESOURCES
CLOSE TO OUR CUSTOMERS



4,100+
SENSORS
EMPLOYEES
WORLDWIDE

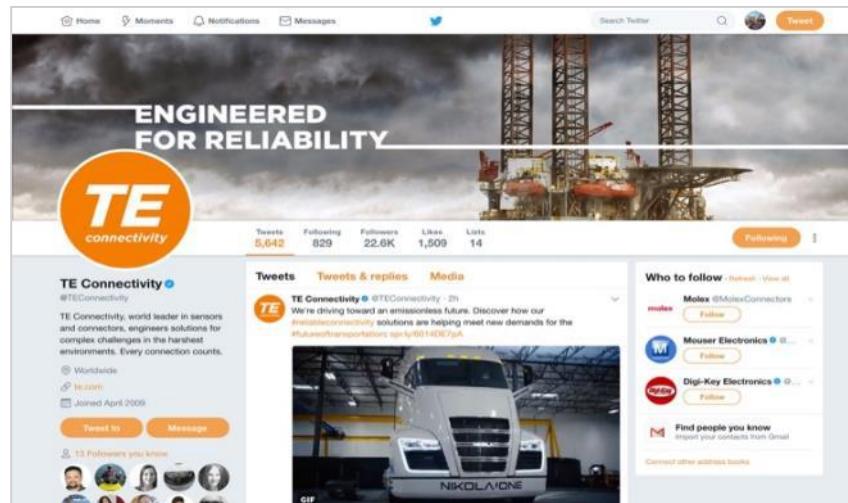
Connect with Us

Learn more

www.te.com



24x7 Live Chat



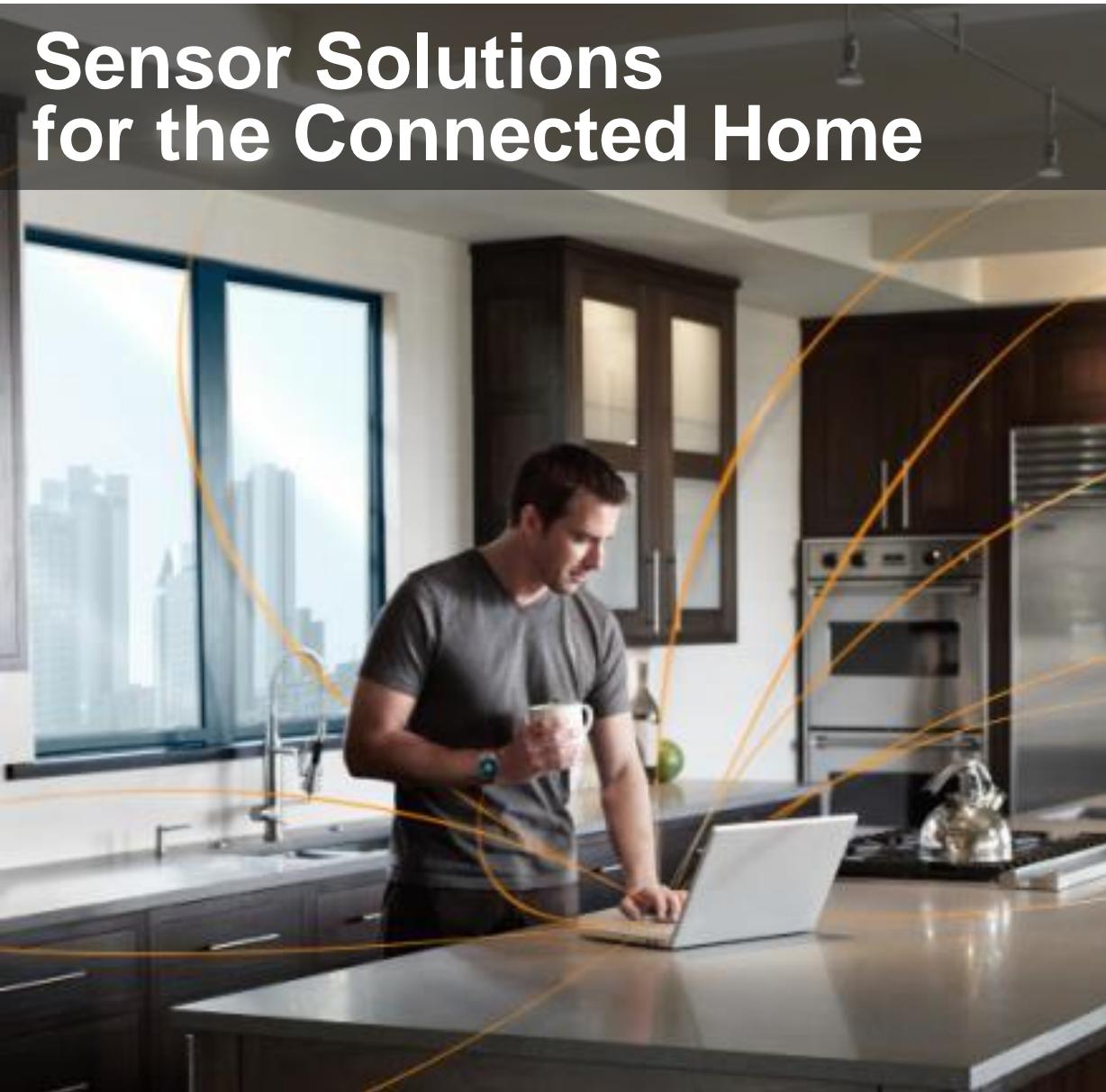
**SMARTER
SOLUTIONS START
WITH TE SENSORS**

www.TE.com

EVERY CONNECTION COUNTS

Sensors Markets and Applications Appendix

Sensor Solutions for the Connected Home



Humidity, Pressure & Temperature

Environmental Sensing, Equipment & Controls



Position

Magneto Resistive Sensors, Environmental, Actuators & Control Sensing



Flow

Reed Switch & Magnet, Equipment Sensing



Pressure

Board Level Sensors, Environmental, Equipment & Control Sensing



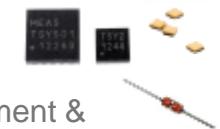
Force

Load Cell, Equipment Sensing



Temperature

NTC Thermistor, Digital Temp. Sensors, Environmental, Equipment & Control Sensing



Humidity

Component Module, Environmental, Equipment & Controls Sensing



Vibration

Piezo Electric Film, Environmental & Actuator Sensing



Sensor Solutions for Automotive



Humidity, Pressure & Temperature

Humidity Air Intake Monitoring, Nox Emissions Management



Mass Air Flow

Mass Air Flow



Fluid Property

Electronic Oil/Temp Level Sensor, Self Calibrating Capacitive Fluid Level Sensor



Position

Low Oil Level Switch & Magnetic Reed Switch



Fluid Property

Engine Oil Condition Viscosity, Density, Dielectric Constant



Pressure

High Pressure Common Rail, Exhaust Manifold, Fuel Pressure & Microfused Sensor



Fluid Property

Fuel Identification & Quality Biodiesel Concentration & Cor



Temperature

Engine Oil, Nickel RTD Sensor



Fluid Property

Coolant Fluid Level Solid State Switch & Level Sensor



Speed

Turbocharger Control & Diagnosis Gear Position an



Sensor Solutions for Automotive



Humidity

Air Intake Monitoring



Humidity

Anti-Fogging/HVACR



Humidity

Seat Heating/Cooling



Mass Air Flow

Mass Air Flow



Position

Tilt / Anti-Theft



Position

MR Brake Pedal



Temperature

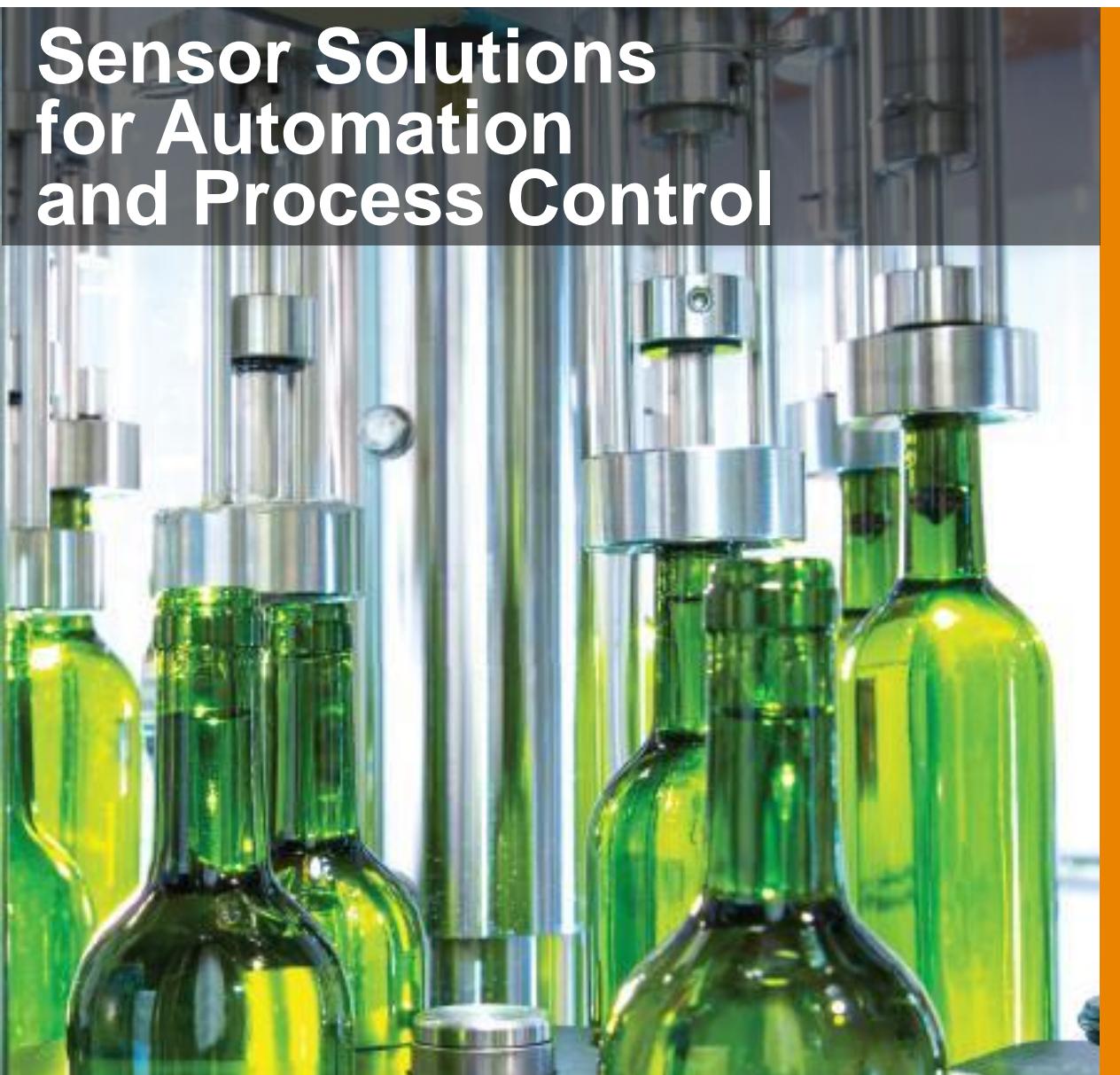
Nickel RTD
Engine Oil



Temperature

Seat Temperature





Sensor Solutions for Automation and Process Control

Fluid Property Fluid Property		Position String Potentiometer	
Force Load Cell		Pressure Transducer	
Position Gagehead		Temperature Thermocouple RTD	
Position Inclinometer		Ultrasonic Fluid Level	
Position Linear Potentiometer		Vibration Accelerometer	
Position Rotary		Speed Measurement, Control and Protection	



Sensor Solutions for Power Generation



Position
Bearing Monitoring



Temperature
Surface



Position
Gas Valve
Control



Temperature
Stator Monitoring



Position
Valve
Radiation



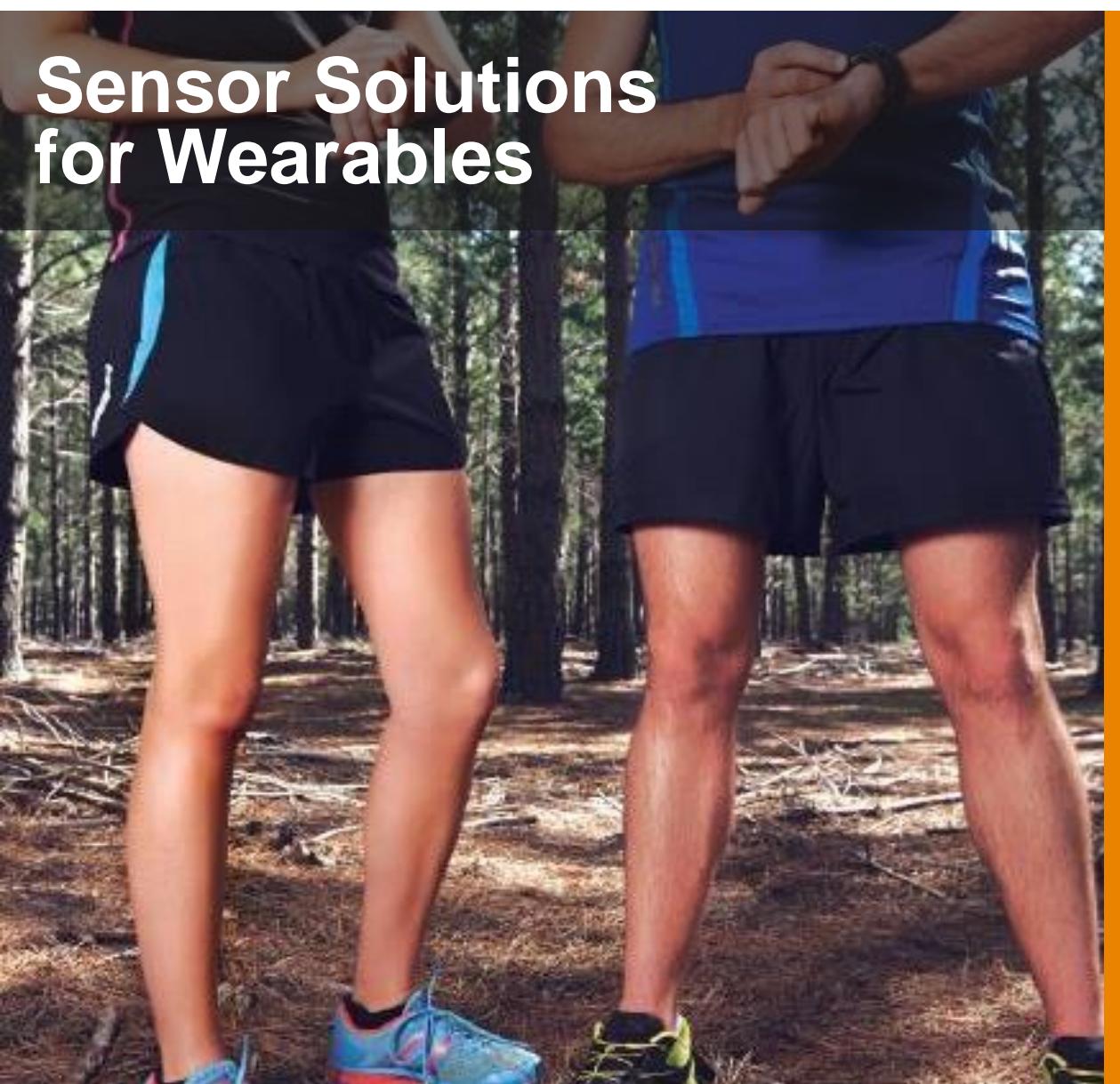
Vibration
Accelerometer
Predictive Maintenance



Temperature
Bearing
Monitoring



Speed
Speed
Measurement,
Control and Protection



Sensor Solutions for Wearables

Pressure

Altitude
Measurement



Pressure

Elevation
Monitoring



Pressure, Temperature, Humidity

Altitude Measurement



Piezo Film

Heart Rate &
Body Motion



Piezo Film

Heart Rate &
Respiration



Sensor Solutions for Medical



Force

Infusion Pump
Microfused Load
Cells Used to Detect
Presence &/or Rate of Flow,
Occlusion, Presence of Needle



Force

Bone Drill Microfused
Load Cell Monitors
the Force Pushing
on the Drill Bit, Robotic Surgery
Torque Measurement



Position

Cable Extension
Position or MR
Contact Less Position,
Monitor Position and Motion of the
Robotic Arm Sections, Position and
Motion of the End Effectors



Photo Optic

Photo-Optic
Sensors Used To
Measure Blood Oxygen
Saturation (SpO_2) & Pulse



Pressure

Blood Pressure
Cuff, Silicon Mem
Pressure Sensor in Cuff



Pressure

Silicon MEMS,
Pressure Media
Isolated, Dialysate Pressure, Home
&/or Hospital Dialysis



Pressure

Disposable Blood
Pressure, MEMS
Pressure Sensor, Invasive
Blood Pressure, Bladder,
Intra uterine Pressure Monitoring



Temperature

Skin Temperature,
Surface Probe for
Continuous Patient Monitoring,
Catheter Thermocouple Wire
Measure Head Temperature During
Various Medical Ablation Procedures



Piezo Film

Heart Pacemaker,
Home Electronic Stethoscope, Sensor
Monitors Body Activity



Ultrasonic

Detect Bubbles or
Medication Levels
During Infusion



Sensor Solutions for Appliances



Force
Load Imbalance



Piezo Film
Vibration Sensi



Humidity
Air Conditioner



Temperature
Microwave Oven



Humidity
Dishwasher
Anti-System



Temperature
Oven



Humidity
Dryer



Temperature
Refrigerator



Humidity
Energy
Management



Temperature
Refrigerator



Sensor Solutions for Wind Turbines



Fluid Level
Gearbox Oil



Temperature
Bearings



Fluid Property
Gearbox Oil



Temperature
Stator Winding



Piezo Film
Energy Harvesting



Vibration
Accelerometer
Gearbox Monitoring



Position
Prop Feathering



Vibration
Accelerometer
Tower Sway



Position
Tower Leveling



Vibration
Accelerometer
Turbine Shroud



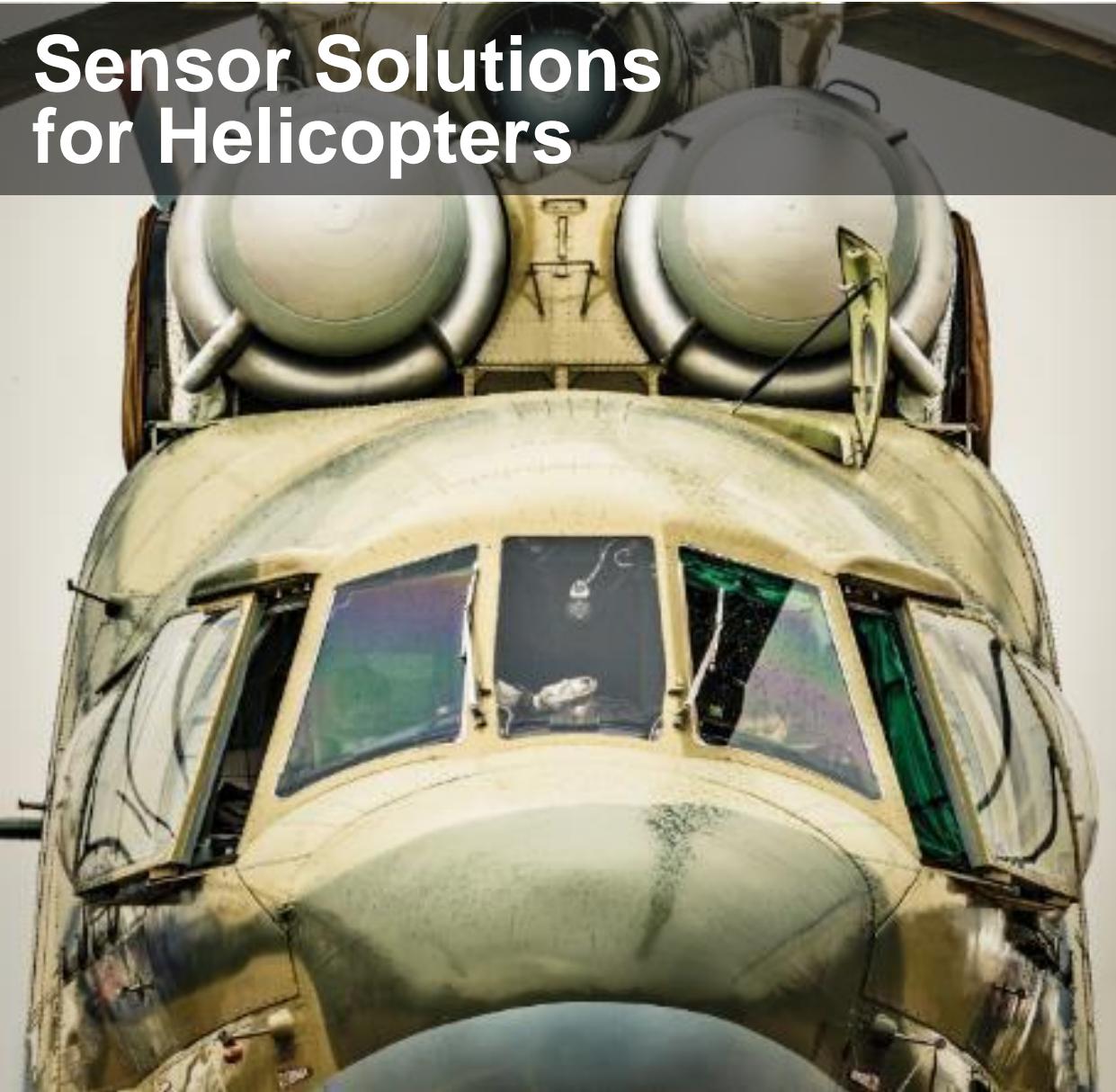
Pressure
Blade Dynamics



Speed
Pole Bands,
Diagnostic
Outputs
Over-Speed Protection



Sensor Solutions for Helicopters



Position

LVDT
Flight Control Actuators



Vibration

Accelerometer
Comfort



Position

LVDT
Targeting System
Lens Focusing



Position

LVDT/RVDT
Cockpit Controls



Vibration

Accelerometer
HUMS



Pressure

Turbine Exhaust



Vibration

Accelerometer
Safety (Impact)



Torque

Contactless Rotor



Speed

Rotor speed



Sensor Solutions for Aircraft



Fluid Property
Hydraulic Oil Fuel



Pressure
Differential Cabin Air



Force
Horizontal Stabilizer Load



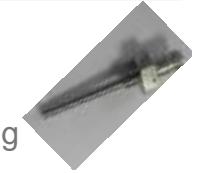
Pressure
On Board Insert Gas Generation System (OBIGGS)



Humidity
Cabin



Temperature
RTD
Fuel Temp Anti-Icing



Position
Anti-Stall Valve
Regional Jets



Temperature
Heated Thermistor
Fuel Mgt.
Hydr. Fluid Temp.



Position
LVDT
Thrust Reverser



Temperature
Thermistor
Cabin Temp



Position
LVDT/Potentiometer
Flight Ctrl Actuator &
EHSV Nose-Wheel Steering
Position Hydr. Fluid Level



Sensor Solutions for Commercial Vehicles



Fluid Level

Single/Multipoint Measurements
Coolant and Lubricant level



Fluid Level

Continuous Measurement
Transmission Oil Level



Fluid Property

Multiple Physical Property Measurements
Fuel, Lubricant and Hydraulic Fluid Quality



Fluid Level

Single/Multipoint Measurements
Fuel Level



QLS

Fluid Property and Liquid Level
Density and Multi-Point Measurements
DEF Concentration and Level



Pressure

Low to Very High Pressure Measurements
Fuel, Lubricants, Coolant, Gases and Hydraulic Fluids



Linear Position

Continuous Measurement
Short to Long Stroke Booms



Linear Position

High Accuracy Measurements
Hydraulic Spool Valves



Angular Position

Single and Multi-Axis Measurements
Vehicle Inclinometer



Speed

Rotary Measurements
Engine, Axle and Turbo Speed



Sensor Solutions for Aerospace



Pressure
Miniature



Position
Valve Actuator



Position
Hall Effect



Temperature
NTC Thermistor



Position
LVDT



Vibration
MEMS Accelerometer



Position
Potentiometer



Vibration
Triaxial
Accelerometer

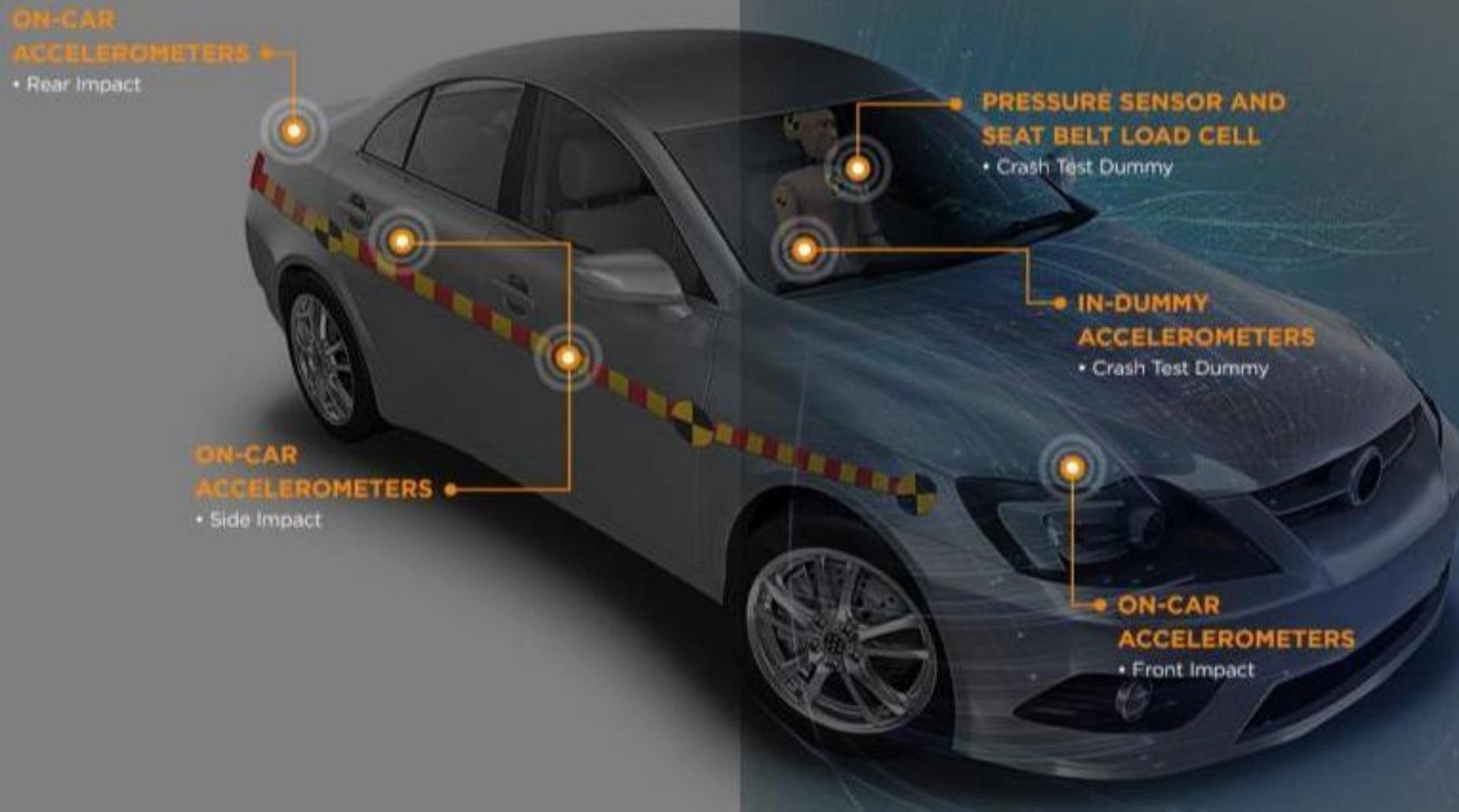


Position
Resolver

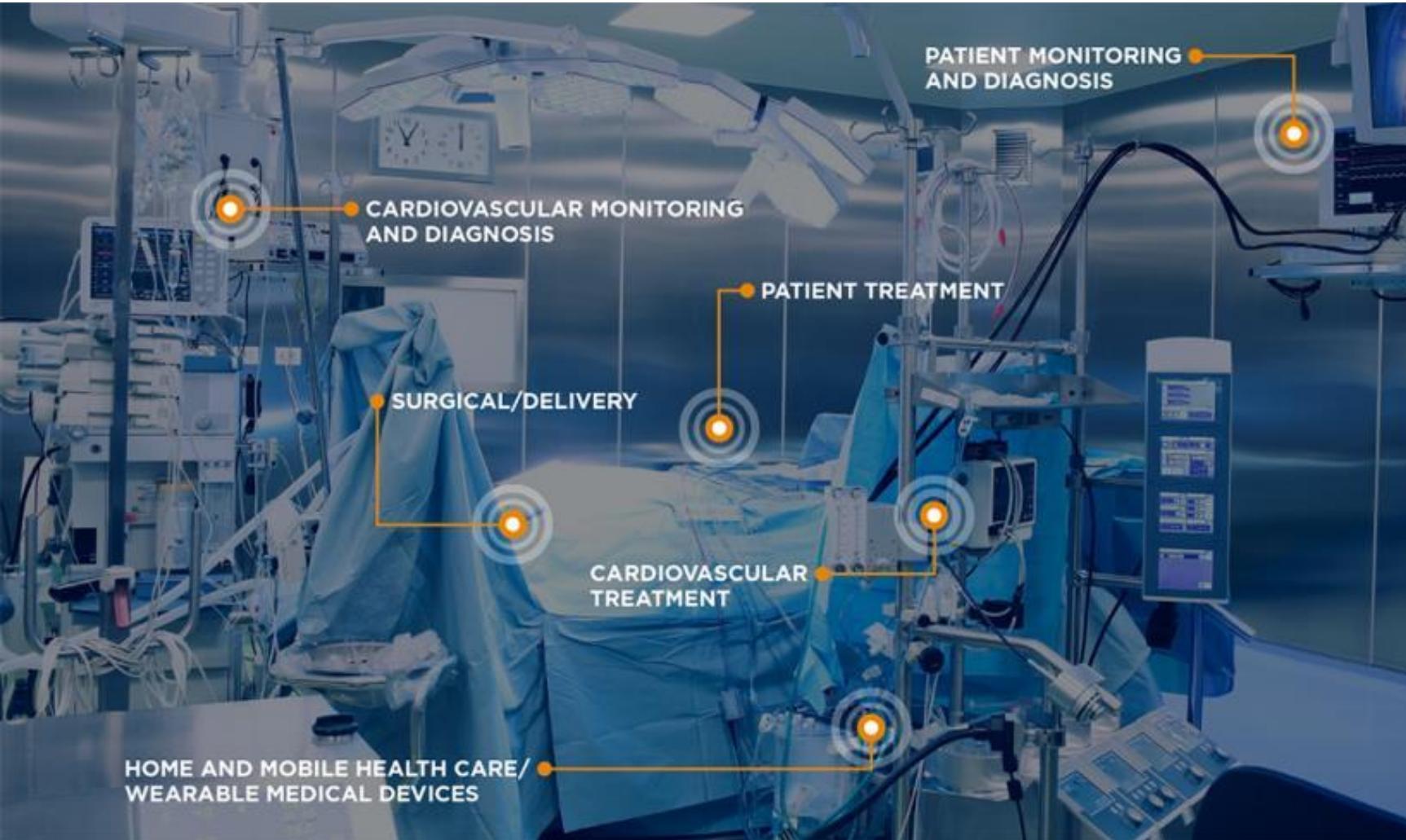


Crash Test Accelerometer Solutions

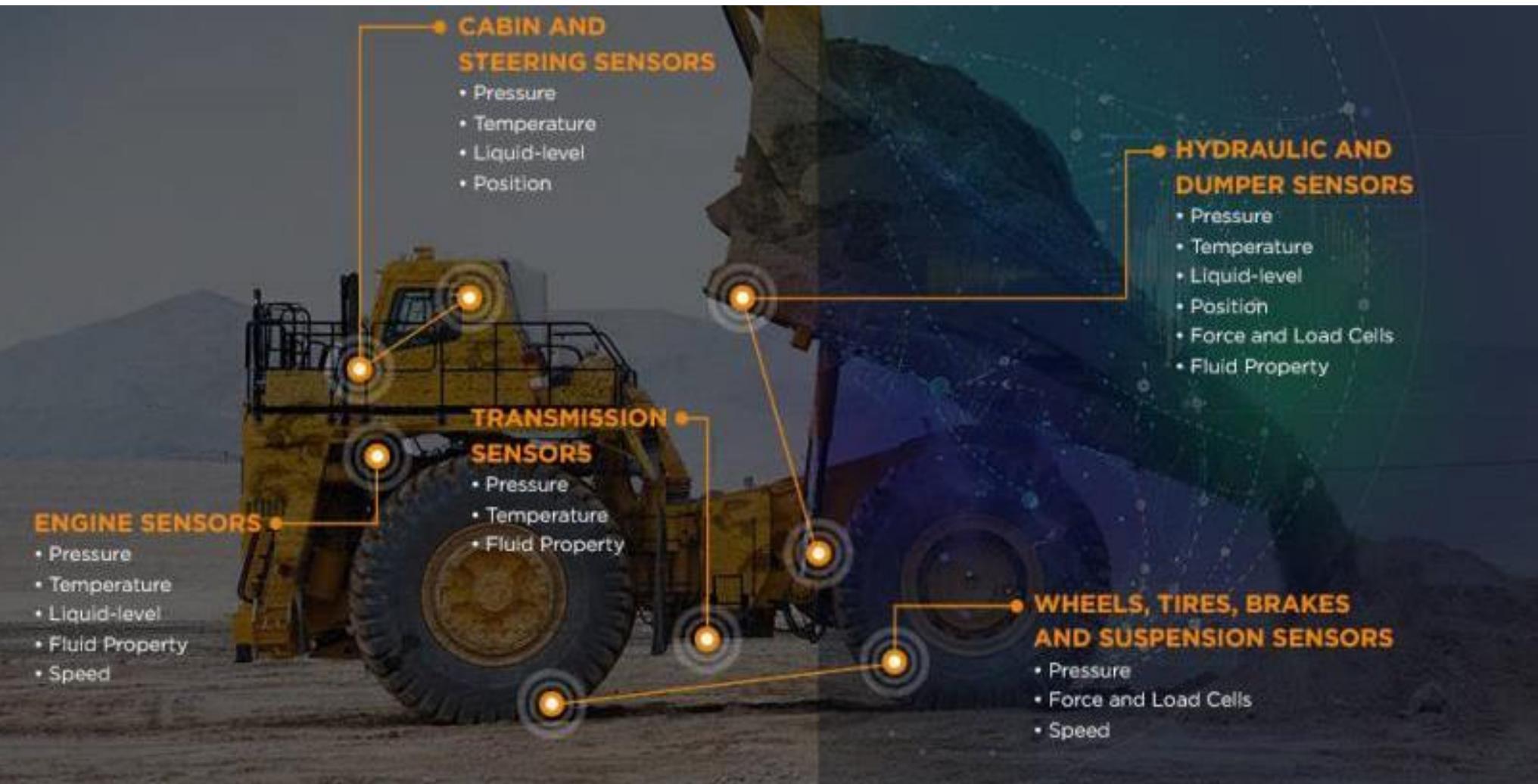
TEST & MEASUREMENT



Medical Sensor Applications



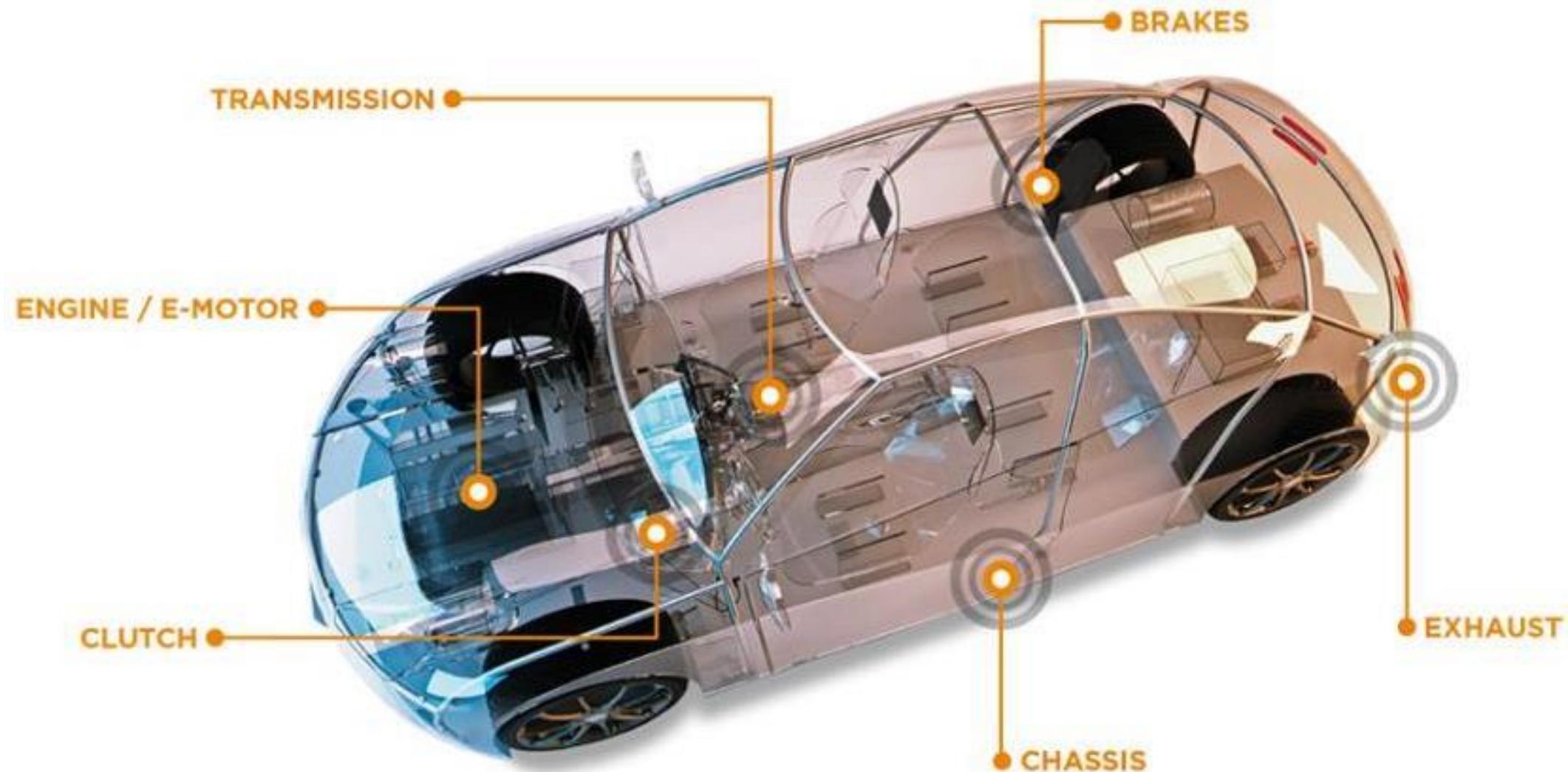
Off-Road Vehicle Sensor Solutions



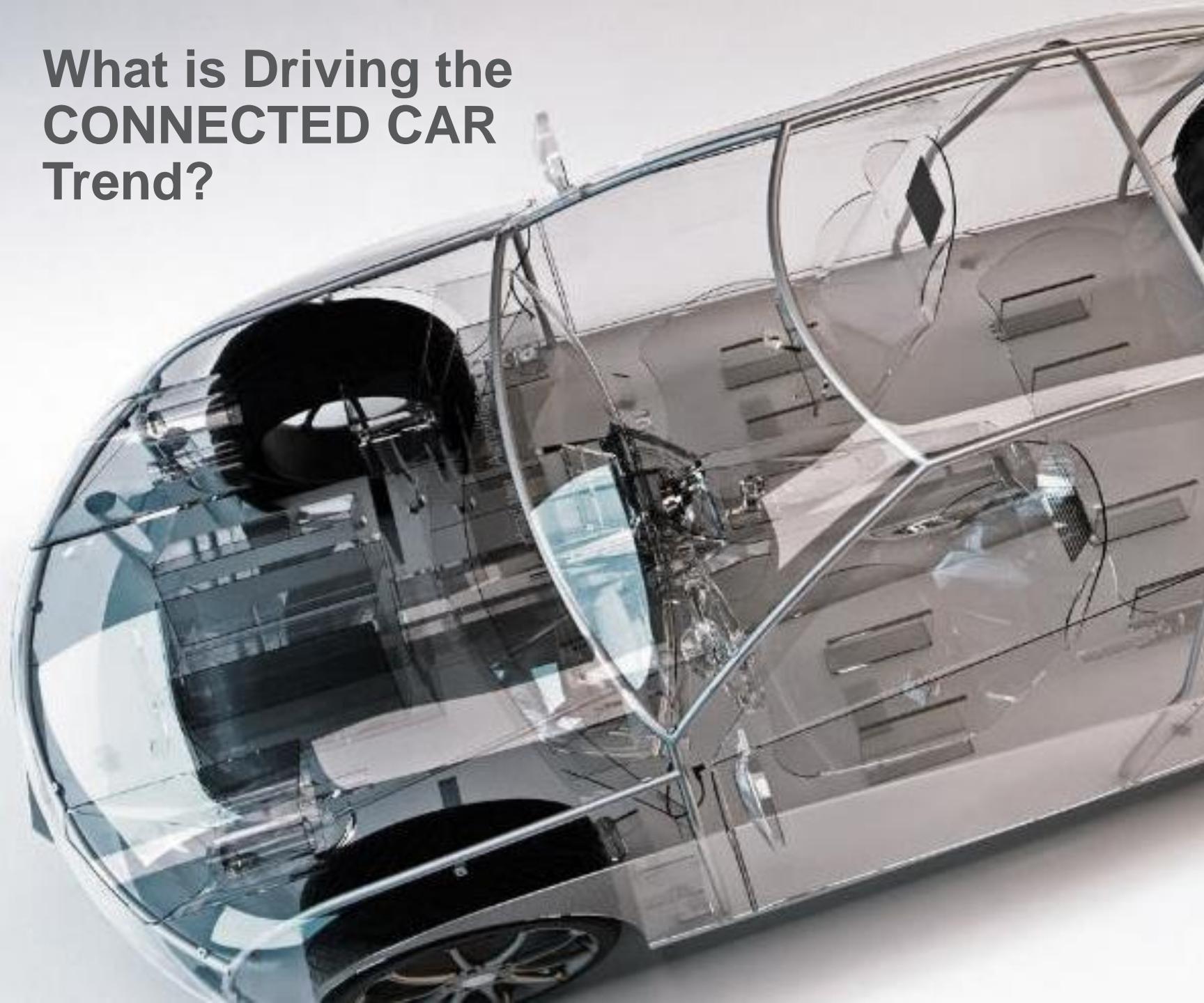
Aerospace Sensor Applications



Automotive Sensor Applications



What is Driving the CONNECTED CAR Trend?



SAFETY

94%

of crashes are caused
by human error.

ENVIRONMENT

Auto industry working to
reduce greenhouse gas
emissions by **2020**

LIFESTYLE

Consumers look to their
cars to stay connected.

Sensors & Markets

	Aerospace & Defense	Appliances / HVACR	Automotive	Consumer Devices	Industrial Equipment	Intelligent Buildings	Medical	Oil & Gas	Test & Measurement	Commercial Trucking
Digital Component			●							
Flow		●	●	●	●	●	●	●		●
Fluid Property	●		●	●	●	●				●
Force	●	●	●	●	●	●	●	●	●	●
Humidity	●	●	●	●	●	●	●	●	●	●
Liquid Level	●	●		●	●	●	●	●		●
Photo Optic										
Piezo Film	●	●			●	●	●	●		●
Position	●	●	●	●	●	●	●	●	●	●
Pressure	●	●	●	●	●	●	●	●	●	●
Rate & Inertial	●				●				●	
Scanners & Systems									●	
Speed	●		●		●			●	●	●
Temperature	●	●	●	●	●	●	●	●	●	●
Torque					●				●	
Ultrasonic					●		●		●	
Vibration	●	●			●			●		●
Water Level					●			●		



The Best in Engineering For Over 70 Years

1940-1950

Revolutionary solderless method to attach electrical terminals to wire



Material science and heat-shrink tubing



1999-2010

Tyco International brings together 88 companies, including AMP & Raychem



Tyco Electronics separates from TI to form independently listed company



Repositions for growth and rebrands



2011-2015

Acquired DEUTSCH, establishing TE as a leader in harsh environment connectivity



Acquired Measurement Specialties establishes TE as a global leader providing sensor solutions



Acquired AdvancedCath



Divests Broadband Networks- further focusing portfolio on harsh environments

TODAY

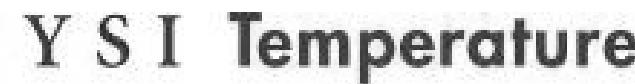
Acquired Jaquet Technology Group, establishing TE as the partner-of-choice in the auto and CT space for sensors



Acquired Creganna Medical



Sensor Brand Legacy



Connected Manufacturing

