

Minda Stoneridge Instruments Limited



JV - Overview

- ❑ Indo – US JV between Ashok Minda Group (51%) and Stoneridge Inc. (49%) since 2004.
- ❑ Leading manufacturer of Instrumentation Clusters and Sensors
- ❑ Business in India, Europe and Russia
- ❑ Plant Locations – Pune , Uzbekistan, Chennai and Pantnagar
- ❑ Established with ‘state of art’ machinery, test equipment and support facilities required for developing and manufacturing fuel / fluid level, pressure, temperature, speed and position sensors and driver information systems.
- ❑ Turn over : Rs.224 Crs 2012 -13
- ❑ Manpower Strength : 900
- ❑ Area : 220,000 sq. ft., additional newly constructed 43,000 sq. ft. for the Sensor Business
- ❑ Certifications : ISO/TS- 16949, ISO 14001, OHSAS 18001

Stoneridge Overview



- A leading independent designer and manufacturer of highly engineered electrical and electronic components, modules and systems principally for the automotive, medium and heavy-duty truck, agricultural and off-highway vehicle markets
- Publicly Traded on the NYSE (SRI)
- Headquarters: Warren, Ohio, USA
- 2011 Revenue(est.): \$1.1 Billion
- Employees: 6,800

"Trusted Supplier with over 80 years in Business"



DAIMLER



Major Customers

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Stoneridge Global Coverage

North / South America

Warren, OH
Novi, MI
Chicago, IL
Canton, MA
El Paso, TX
Lexington, OH
Greenwood, SC
Dublin, VA
Fort Wayne, IN
Portland, IN
Portland, OR
Seattle, WA
Juarez, Mexico
Chihuahua, Mexico
Monclova, Mexico
Manaus, Brazil
São Paulo, Brazil

14

Manufacturing Centers

30

Sales & Engineering Support Offices

3

Joint Ventures



Asia Pacific

Shanghai, China
Suzhou, China
Yokohama, Japan
Pune, India
Seoul, S. Korea

Europe

Dunton, England
Dundee, Scotland
Stockholm, Sweden
Örebro, Sweden
Frankfurt, Germany
Cologne, Germany
Stuttgart, Germany
Nuremburg, Germany
Tallinn, Estonia

Stoneridge Global Customers

SPARK MINDA
ASHOK MINDA GROUP

Stoneridge
Powered by Passion

DAIMLER



BOSCH



DELPHI

CATERPILLAR®



TOYOTA



Domestic Customers



Recognition



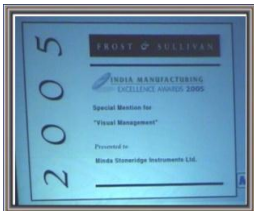
**Frost and Sullivan
Manufacturing Excellence Award
for
Best Visual Management, 2005 and
gold award 2008, 09 & 10**



**M&M tractors Best
performer in electrical
Category 2008**



**TATA Motors Best
Delivery 2008,
09,10**



**Golden Peacock Award for
Training Management, 2009.**



**Bajaj TPM Award
2011**

**Bajaj Q award
for Best Quality
Bronze 2008
Silver 2009
Gold 2010**

**Economic times
Manufacturing
excellence award
2010**

Recognition



**ACMA Quality
Circle Award
2008**



**Ranked 51 in the 'India's Best
Companies to Work for 2010'
Based on survey done by Great
Place to Work Institute India &
Economic Times**



**NCQC- Excellence 2008
NCQC – Par Excellence 2009**

Products – Speed Sensor

➤ Non Contact (NC) Type



Side sensing



Base sensing

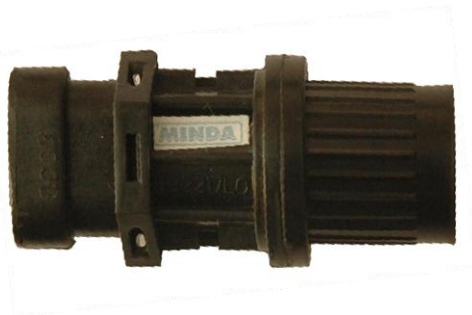


With pig tail



Hub mounted

➤ Contact Type



Speed Sensor



- Applications include engine, wheel, ABS, crank**, cam** and transmission speed sensors.

** - VR Technology

- Contact type hall effect Speed sensor, which can be fitted at gearbox output for existing mechanical speedometer cable output Variable.
- Variable Reluctance type Contactless Speed sensors.
- Hall effect Active contactless Speed sensors. (Vehicle speed / ABS application)
- Various mounting capabilities – threaded, flange, cabled, integrated connector, etc.

Products – Fuel Level Sensor

SMR



TFR Type



TFR with suction tube



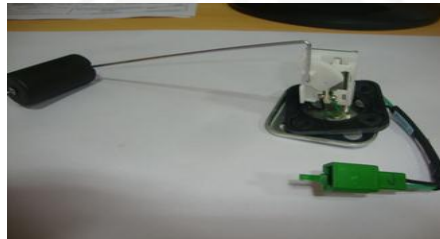
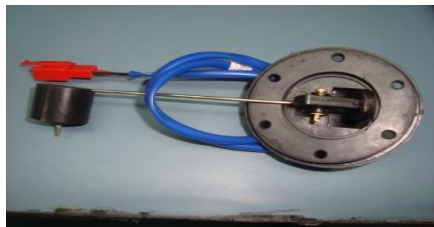
Tubular Type



TFR with Float



Float Switch



Wire wound Type



Fuel Level Sensor



- Float type Sensor with Sheet metal or plastic body.
- Tubular tank unit with Reed switch / hall effect technology.
- Wire wound, Surface mounted elect or thick film printed resistance sensing element.
- Value added sensor with built in and out flow pipes and primary filters.
- Sensor modules to fit on fuel pump assembly.



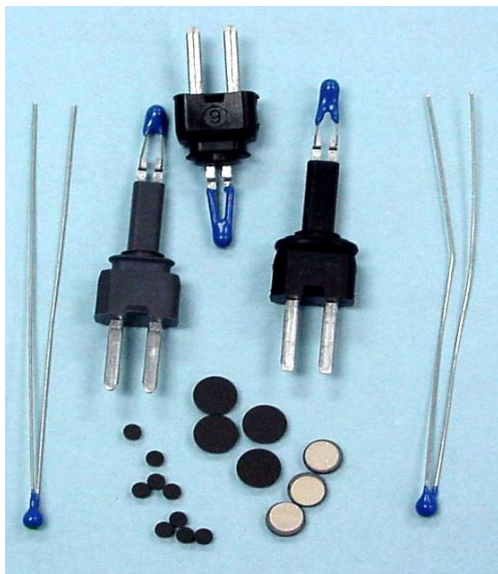
Fluid Level Sensor



- Applications include Oil, Coolant, Water ,Fuel , Transmission, Brake Fluid, Urea and Windshield washer level sensors.
- Combination of fluid level and temperature in one package.
- Vertical and horizontal devices
- Reed switch technology
- Digital or analog output

Products – Temperature Sensor

**NTC
thermistors and
Sub-assy.**



**Temp sensors
with different
mounting
configurations**



**Typical Brass
body sensors**



Temperature Sensor



- Applications include Oil, Fuel, Coolant, Air, Surface, Cylinder Head, Exhaust Gas Recirculation and Exhaust Gas Temperature sensing.
- NTC Sensors (RTD Sensors available for 600 °C and above temperature)
- Range - 40°C to 350°C
- Vertical integration includes housings and NTC thermistor (at JV partner)
 - 150° C Conventional Coolant temperature Sensor with Brass body and NTC thermistor sensor.
 - Coolant Temperature sensor with patented plastic body.
 - Ultrafast response plastic body sensors.
 - 200°C and 300°C manifold air temperature sensor.



Position Sensor

- **Linear and Angular position Sensors**
- **Fully Encapsulated electronics with Hall Effect Technology**
- **Custom made mounting and contact design**
- **Analog or PWM outputs**
- **Wide working temperature range up to 150°C**
- **Applications includes:**
 - **Various rotary applications**
 - **Pedal or throttle position sensor**
 - **Steering Angle position sensor**
 - **Seat Track position Sensing**



Pressure Sensor

- **Typical Applications-Automotive / Commercial Vehicle / Agriculture**
 - Fuel Emissions System-Fuel Pressure Sensing (Gasoline, Natural Gas, Diesel)
 - Climate/HVAC Control
 - Steering/Suspension Systems
 - Transmission System
 - Engine Systems-Oil Pressure , Vacuum Sensing
 - Breaking System –Pressure/Vacuum Sensing
- **Wide electrical load: 5mA to 1A Current**
- **Single Function/Dual Function**
- **Normally Open or Normally Closed**
- **Wide Differential-**
 - Mini Low
 - Low
 - High



Application Overview

FUEL / EMISSIONS SYSTEMS

Manifold Temp Sensing
Exhaust Gas Temp Sensing
Exhaust Gas Re-Circulation
Fuel Level, Temp and Pressure Sensing
Throttle Position Sensing

ENGINE SYSTEMS

Fluid Level Sensing
Oil Pressure Switches
Oil, Air & Surface Temperature Sensing
Engine Speed Sensing

STEERING/ SUSPENSION SYSTEMS

Pressure Switches
Fluid Level Sensing
Steering Angle Position Sensing

BRAKING SYSTEMS

Wheel Speed Sensing
Bearing Sensors
Pressure Switches
Fluid Level Sensing

CHARGING SYSTEMS

Battery Temp Sensing
Master Disconnect
Battery Disconnect Switch

ALL WHEEL DRIVE SYSTEMS

PTU Temp Sensing
Transfer Case Position Sensor

IN-CABIN CONTROLS

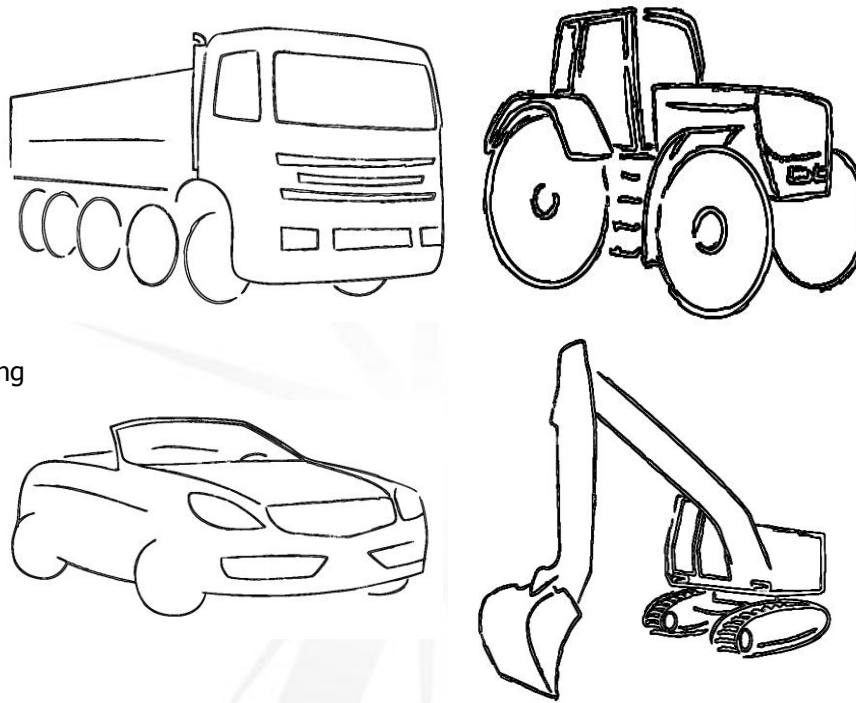
Air Temp Sensing

SAFETY / SECURITY SYSTEMS

ABS Sensors
Seat Track Position Sensors
Seat Belt Buckle Sensors

TRANSMISSION SYSTEMS

Fluid Level Sensing
Shift Position Sensing (PRNDL)
Fluid Temperature Sensing
Pressure Switches
Vehicle Speed Sensing
Transmission Input /Output Speed Sensing

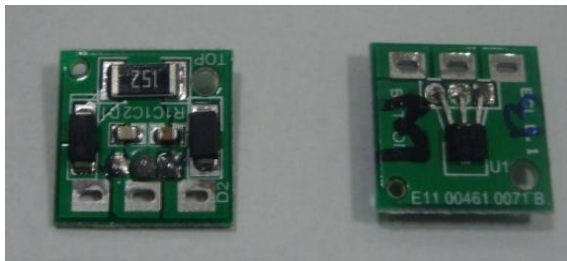
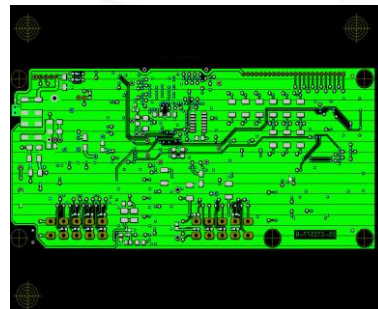
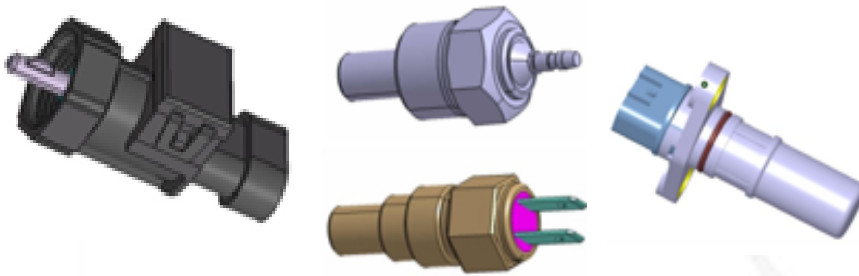


Sensor Facility



- **Separate newly constructed 43,000 sq. ft. for the Sensor Business**
- **Clean Room**
- **Latest IT and Communication equipment**
- **All Engineering group under one roof**
- **State of the art equipment and facilities**
- **Over 25 Engineers in various disciplines including Mechanical / Electronics (Hardware / Software) / Design verification team etc.**

Design Tools



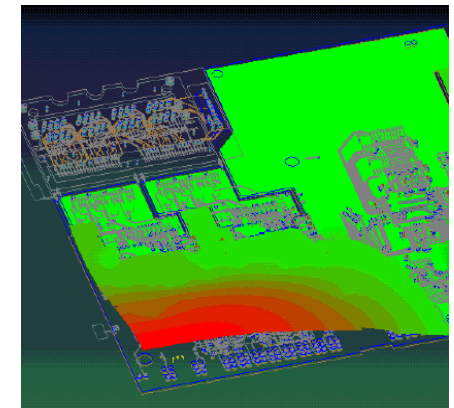
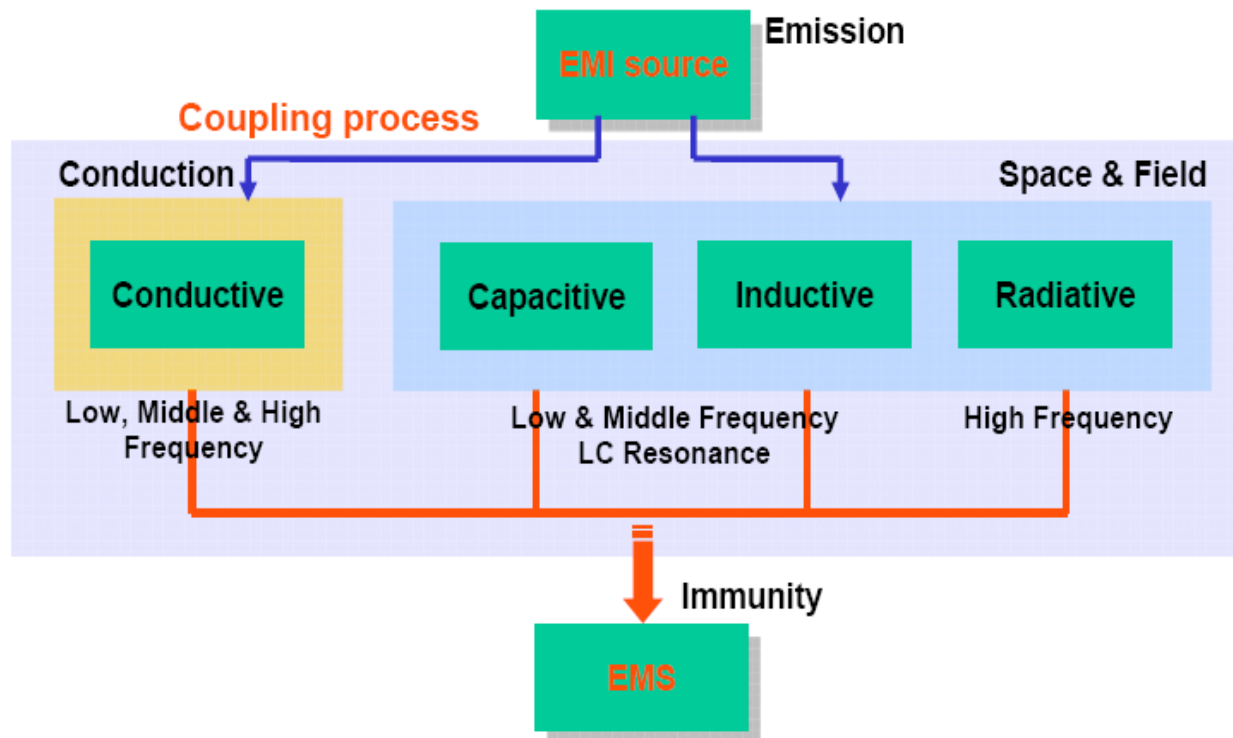
➤ Equipped and expertised in various software including

- Catia
- Pro-E
- Unigraphics
- Ideas
- Autocad
- Plastic adviser
- CiMatran

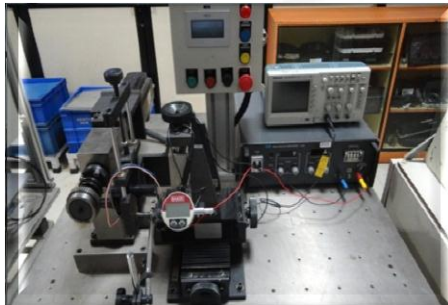
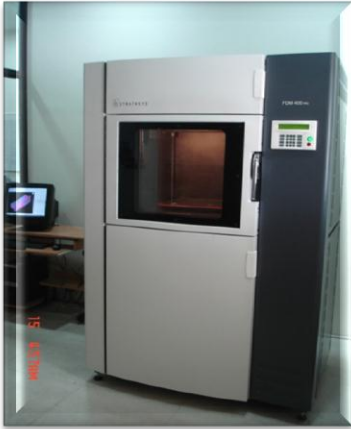
➤ PCB design capability:

- ORCAD tool for PCB design
- Single and multi layer designs
- Design for manufacturability
- EMI / EMC design

Simulation & Testing



Design Verification / Validation



- **Rapid Prototype Machine**
 - FDM type
 - PC/ABS Material
 - Max. Size:
355X254X254 mm
- **Vacuum casting**
- **Silicon Molds**
- **Paint shops**
- **Automated programmable test and measuring equipment**
- **Air Gap Analyzer**

Validation Facility

**Vibration Testing with
Environment Chamber**



Environment Chamber



Rain Chamber



Dust Chamber



Salt spray Chamber



Endurance Tester



Tooling & Moulding



- **2 VMC Machines**
- **2 EDMs**
- **Molding Machines – 20Nos.(Ranging from 35 to 200 T)**
- **Make:**
 - **Engel**
 - **Hurong**
 - **Wincer**
 - **Ceramic**
 - **Milackron**
 - **Super Master**
- **MOLD FLOW**
- **Unigraphics (UG NX7)**
- **DELCAM - CNC**

➤ Engineering Raw Material

- **ABS - Acrylonitrile Butadiene Styrene**
- **PA - Polyamide (PA 6, PA66, PA4-6)**
- **PBT - Polybutylene Terephthalate**
- **PMMA - Polymethyl Methacrylate**
- **PC - Polycarbonate**
- **PP - Polyproplyn**
- **Acrylic Resin**
- **POM - Co-Polymer Acetyl**

PCB Assembly Capabilities



- **SMT Machines –**
 - **Fuji XP141**
 - **Fuji NXP**
- **Component Placement capacity –**
 - 22 K/Hr.**
- **Robotic and Wave soldering facilities**
- **Max Board Size - 357 x 400 mm**
- **SMT Assembly Line compatible for Lead free operations .**
- **With above machine any Non Standard SMT Package can be assembled.**
- **Through Hole or Hybrid PCB assembly**
- **Monthly average 3,50,000 PCB assembly**



Thank You