

### **Summary**

Automotive Sensors are vital components of automotive electronic systems, as modern vehicles rely on these electronic systems to make sure vehicles meet efficiency and security standards as well as environmental regulations. Driven by government regulations of safety and emissions, introduction of high-end options in modern vehicles by major automobile manufacturers and consumer demand for safety, comfort, infotainment applications and fuel efficiency, automotive electronics content per vehicle is on the rise. As the electronics content is increasing in automobiles, the number of <u>automotive sensors</u> used in vehicles is also increasing.

Primarily, the government regulations in North America, Europe, Japan, China and South Korea, driving demand for automobile safety features that ranges from passive to integrated active and passive safety systems. These developments are driving increased demand for applications such as tire pressure monitoring, electronic stability control, occupant detection and advanced driver assistant systems. Also, the number of electronic components in engine management, fuel efficiency, occupant comfort & convenience applications and infotainment systems are increasing. In addition, the use of networking in automotive applications continues to increase as various subsystems communicate within vehicle and with the external devices and networks. Driven by these advancements in automotive industry, the global market for automotive electronics, estimated at US\$191.3 billion in 2013, is further projected to reach US\$314.4 billion1 by 2020, thereby maintaining a CAGR of 7.3% between 2012 and 2020. (Source: Global Automotive Electronics Market, Industry Experts)

Overall, the major driving forces for increased <u>demand for automotive sensors</u> in vehicles include regulatory mandates for improving fuel economy and stringent emission standards as well as requirements for advanced safety systems. The growth is also attributed by consumer demand for safety & security, comfort & convenience features and the growth of hybrid and electric vehicles which is creating enormous opportunities for new types of sensors in automobile industry. <u>Automotive Sensors market worldwide</u>, standing at US\$16.2 billion in 2012, estimated to be US\$17.4 billion in 2013 and forecast at US\$18.8 billion in 2014, is further projected to reach US\$30.3 billion by 2020, thereby posting a CAGR Of 8.2% between 2012 and 2020. Estimated to be US\$2.6 billion in 2013, demand for Automotive MEMS Sensors globally is projected to reach US\$4.7 billion by 2020.

Automotive sensor product segments analyzed in this study include position sensors, pressure sensors, speed sensors, oxygen sensors, accelerometers, rollover sensors, yaw rate sensors, temperature sensors, mass airflow sensors and other automotive sensors. Automotive sensors market is also analyzed by automotive end-use application area including powertrain, chassis, safety & security, body, communication & navigation and other automotive applications. Further, this report also focuses on automotive MEMS sensors market analyzed by product segments including MEMS pressure sensors, MEMS accelerometers, MEMS gyroscopes, MEMS flow sensors and other MEMS sensors; and by end-use applications comprising powertrain, chassis, safety & security and other applications.

The report reviews, analyses and projects the <u>automotive sensors market</u> for global and the regional markets including North America, Europe, Japan, Asia and Rest of World. The regional markets further analyzed for 14 independent countries across North America – The United States, Canada and Mexico; Europe – France, Germany, Italy, Spain and The United Kingdom; Japan; Asia – China, India and South Korea; Rest of World – Brazil and Turkey.

This 448 page global market report includes 206 charts (includes a data table and graphical representation for each chart), supported with meaningful and easy to understand graphical presentation, of market numbers. The statistical tables represent the data for the global market value in US\$ by geographic region, product segment and end-use application. This report profiles 49 key global players and 97 major players across North America – 39; Europe – 35; Japan – 16; Asia – 5 and Rest of World - 2. The research also provides the listing of the companies engaged in manufacturing and supply of automotive sensors. The global list of companies covers addresses, contact numbers and the website addresses of 200 companies.



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Littelfuse Acquires Hamlin, Inc

Hamamatsu Initiates Building a New Plant

IDG-Accel China Capital II, L.P. and Associates to Acquire MEMSIC

API Technologies Corp's Sensor Operations Acquired by Measurement

Freescale Plans to Broaden its Presence in China

Continental's LocSync software Patented TPMS and Short Range Radar

Sensors Wins Automotive News PACE Awards

Delphi Expands its Beijing Gasoline Engine Management Systems Unit

Mouser Establishes Strategic Alliance with Elmos and Silicon Microstructures BorgWarner Manufactured Three Million Pressure Sensor Glow Plugs to Date

DENSO Plans to Establish a New Production Company in Cambodia

LTi Group Plans to Merge in Körber AG

CTS Corporation Acquires D&R Technology, LLC

Aftermarket Distribution Agreement between BorgWarner and Federal-Mogul

TT Electronics Establishes a New Unit in Mexicali, Mexico Measurement Specialties Completes Acquisition of RTD Delphi Takes Over FCI's Motorized Vehicles Division

DENSO Plans to Establish New Production Unit in Indonesia

Schrader Reaches 200 Million Units Production of Direct TPMS Sensor Denso Awarded Infineon with a 2011 Technical Development Award

Littlefuse Acquires ACCEL AB

Bourns Takes Over Jensen Devices AB's Assets

VTI Technologies Renamed as Murata Electronics Oy

Infineon Ships Two Billion Sensor Chips to Date

Schrader International Acquired by Madison Dearborn Partners

Bourns Automotive Division Manufacturing Unit in Mexico Expanded

Gentech International Acquired by Measurement Specialties

Merger Agreement between CTS Corporation and Valpey-Fisher Corporation

Austriamicrosystems and TAOS Starts a New Location in Silicon Valley

Austriamicrosystems Inaugurates a New Location in Shenzhen

Austriamicrosystems Acquires Texas Advanced Optoelectronic Solutions, Inc. SensorDynamics Acquired by Maxim Integrated

Sensata Technologies Takes Over "Automotive on Board" Sensors Business of Honeywell

Hamamatsu Sets Up European Subsidiary MEMSIC Acquires Crossbow Technology

### 5. KEY PRODUCT TRENDS

MEMSIC Debuts Two-Axis Magnetic Sensor

Micronas Introduces Novel ESD-Proof Linear Hall-effect Magnetic Sensors Freescale Introduces Novel Xtrinsic Intelligent Sensor Hub FXL95000CL Implementation of Test-in-tray Handler of Centipede for Parallel Testing of

AMS Launches AS8515 Reference Design for Automotive IBS Implementation Continental Introduces its Novel Electronic Rear Cross Traffic Alert



HSCD Series Portfolio of Alps Electric Added with Wide Dynamic Range Type Compact Geomagnetic Sensor

Sensata Technologies Introduces Generation-2 Differential Pressure Sensors Allegro MicroSystems Reveals QFN Package for Their Current Sensor IC Family Launch of Melexis' MLX92212 Family of Digital Output Hall Effect Sensors Novel A1233 Monolithic IC of Allegro MicroSystems

Littlefuse Introduces New Low Profile 600W TVS Diode

Micronas Introduces 3D HAL® Technology Based HAL 3675 Sensor

AMS Unveils the AS8515 System-in-Package

Freescale Presents Three Novel MPXHZ9000 Highly Precised Pressure Sensors

Launch of Novel Xtrinsic MMA8491Q Accelerometer by Freescale AMS Releases 60 Series Magnetic Rotary Position Sensors

Infineon Launches Novel Hall Switches and Angle Sensors for BLDC Motor Control

Members of C2C-CC Plans to Produce Standard Car-to-X Communication Systems from 2015

Continental Inaugurates Novel Automated Indoor Braking Analyzer

Continental Presents Novel Tire Pressure Monitoring Systems

Schrader International Launches EZ-tire™ Sensors

Micronas Announces Programmable HAL 2420 and HAL 2425 Hall-effect Sensors

Freescale Debuts Industry's First CAN-Based Automotive-Qualified Battery Sensor

Maxim Unveils MAX17823, Fourth Generation of its High-Voltage e-car Battery Sensor

Melexis Unveils MLX90809, a Robust, High Precision MEMS Pressure Sensor

Analog Devices Demonstrates Microcontroller, A/D Converter and Sensor

System Design Tracks at Renesas' Conference in California

Maxim Introduces Four Fully-Integrated Devices for Use in Factory Automation and Automotives

ELMOS Launches E520.33 Sensor Signal Readout IC with SENT Interface World's Smallest Vision Sensor from DENSO for Automotive Safety

New Range of Gas Flow Sensor Modules Launched by MEMSIC Fuel Conservation Facilitated through Murata's MEMS Sensors

Infineon Introduces KP200 Pressure Sensor for Pedestrian Protection Systems

Analog Devices Debuts ADIS16480 10-DoF MEMS IMU with integrated EKF

Analog Devices Introduces ADIS16407 10-DoF MEMS iSensor IMU

Allegro MicroSystems' A4942 Three Phase Sensorless BLDC Motor Driver IC

Allegro MicroSystems Heralds ACS759 Current Sensor IC

First Lightning Sensor IC in the World, AS3935 Franklin Lightning Sensor Unveiled

Unveiling of TSL4531 Ambient Light Sensors by austriamicrosystems Allegro MicroSystems Unveils A1357 Hall Effect Linear IC with PWM, Two-wire

Allegro MicroSystems' A4960, Three Phase Sensorless BLDC Motor Control IC Revealed

Introduction of Industry's First Digital Color RGB and Proximity Sensors by

Unveiling of MLX91207 High Speed Current Sensor by Melexis

Advanced Airbag Sensors from Freescale Semiconductor

Development and Manufacture of HSHCA Series Capacitive Humidity Sensor

Launch of A3944 Automotive Pre-Driver IC by Allegro MicroSystems Unveiling of AB Elektronik's IndiSense Large Displacement Encoder

Schrader's Extension of EZ-sensor™ Coverage Enabled by the Addition of New

Austriamicrosystems Debuts World's First 3D Hall Sensor Solution

Introduction of HALOSENSOR NANO by AB Elektronik

Launch of 3D Hall Technology based HAL 3855 Sensor by Micronas

AB Elektronik's AdBlue Monitoring Sensor

Freescale Launches Novel MEMS Technology based Xtrinsic MPL3115A2 Pressure Sensor

AB Elektronik's Multi-Media Interface Developed

Development of Alps' RDC90 Series Compact Highly Durable Resistive Rotary

Introduction of Combined Torque and Angle Sensor by Bourns for EPAS Development of Alps' HSCDTD004A 3-Axis Geomagnetic Sensor for Electronic

Compass

Unveiling of Freescale's MM912J637 Intelligent Battery Sensor Melexis Presents MLX75411 "Avocet" High Dynamic Range image sensor Freescale Presents the First Xtrinsic MAG3110 Magnetometer-Based Sensor Aftermarket Release of BorgWarner's Pressure Sensor Glow Plug

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Aleph America Corporation (United States) Allegro Microsystems, LLC (United States) Alps Electric USA, Inc. (United States)

American Electronic Components Inc (United States)

Analog Devices, Inc. (United States) Aptina Imaging Corporation (United States) Austriamicrosystems USA, Inc. (United States)

Bourns, Inc. (United States)

Casco Products Corporation (United States)

CTS Corporation (United States)

D&R Technology, LLC (United States)

Custom Sensors & Technologies, Inc. (United States)

BEI Sensors (United States)

Delphi Automotive LLP (United States) Elesys North America Inc. (United States)



Freescale Semiconductor, Inc. (United States) GE Measurement & Control Solutions (United States) Hitachi Automotive Systems Americas, Inc. (United States)

Kavlico Corporation (United States)

Littelfuse, Inc. (United States) Hamlin Electronics LP (United States) Magna International Inc. (Canada)

Maxim Integrated (United States)

Measurement Specialties, Inc (United States)

MEMSIC Inc (United States)

Methode Electronics, Inc. (United States)

Micralyne, Inc. (Canada)

Novotechnik U.S., Inc. (United States) Optek Technology, Inc. (United States) PCB Piezotronics, Inc. (United States) Schrader International, Inc. (United States) Sensata Technologies, Inc. (United States)

Silicon Microstructures Incorporated (United States)

SSI Technologies, Inc. (United States) Stoneridge, Inc. (United States) Texas Instruments Inc. (United States)

TRW Automotive Holdings Corp. (United States)

Wabash Technologies (United States) Yazaki North America Inc. (United States)

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AB Elektronik GmbH (Germany)

Accel AB (Sweden)

Accel Elektronika UAB (Lithuania) Alps Electric (Ireland) Limited (Ireland)

AMS AG (Austria)

Appliedsensor GmbH (Germany)

Autoliv Inc. (Sweden)

Borgwarner Beru Systems GmbH (Germany)

Contelec AG (Switzerland) Continental AG (Germany)

Conti Temic Microelectronic GmbH (Germany)

Elmos Semiconductor AG (Germany)

Epcos AG (Germany)

Gentech International Ltd (United Kingdom)

Hella KGaa Hueck & Co. (Germany) I.G. Bauerhin GmbH (Germany) Infineon Technologies AG (Germany)

Kistler Group (Kistler Instrumente AG) (Switzerland)

Kistler Automotive GmbH (Corrsys-Datron Sensorsysteme GmbH) (Germany)

LTi Holding GmbH & Co. Kg (Germany)

Sensitec GmbH (Germany) Magneti Marelli SpA (Italy)

Melexis N.V. (Melexis Microelectronic Integrated Systems) (Belgium)

Micronas Semiconductor Holding AG (Switzerland)

Murata Electronics Oy (Finland)

Novotechnik Messwertaufnehmer OHG (Germany)

NXP Semiconductors N.V. (Netherlands)

Osram Opto Semiconductors GmbH (Germany)

Philips Laser Sensors (Royal Philips NV) (The Netherlands)

Preh GmbH (Germany)

Robert Bosch GmbH (Germany)

Sensirion AG (Switzerland)

STMicroelectronics (Switzerland)

TE Connectivity Ltd (Switzerland)

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Denso Corporation (Japan)

Hamamatsu Photonics KK (Japan) Hitachi Automotive Systems, Ltd. (Japan)

Keihin Corporation (Japan)

Minebea Co Ltd (Japan)

Mitsubishi Electric Corporation (Japan)

Murata Manufacturing Co Ltd (Japan) NGK Spark Plug Co Ltd (Japan)

Nippon Aleph Corporation (Japan)

Nippon Ceramic Co Ltd (Japan)

Omron Corporation (Japan)

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TDK-EPC Corporation (Japan)

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Minda Stoneridge Instruments Ltd. (India) PLK Technologies Co. Ltd. (South Korea)

Shanghai Nicera Sensor Co Ltd (China)



Universal Sensors, Inc. (China)

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Chart 195: Brazilian Automotive Sensors Market Analysis (2010-2020) by Product Segment – Position Sensors, Pressure Sensors, Speed Sensors, Oxygen Sensors, Accelerometers, Rollover Sensors, Temperature Sensors, Yaw Rate Sensors, Mass Airflow Sensors and Other Automotive Sensors in US\$ Million

Chart 196: Glance at 2010, 2015 and 2020 Brazilian Automotive Sensors Market Share (%) by Product Segment – Position Sensors, Pressure Sensors, Speed Sensors, Oxygen Sensors, Accelerometers, Rollover Sensors, Temperature Sensors, Yaw Rate Sensors, Mass Airflow Sensors and Other Automotive Sensors

Chart 197: Brazilian Automotive Sensors Market Analysis (2010-2020) by End-Use Application – Powertrain, Chassis, Safety & Security, Body, Communication & Navigation and Other Automotive Applications in US\$ Million

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Chart 199: Turkish Automotive Sensors Market Analysis (2010-2020) by Product Segment – Position Sensors, Pressure Sensors, Speed Sensors, Oxygen Sensors, Accelerometers, Rollover Sensors, Temperature Sensors, Yaw Rate Sensors, Mass Airflow Sensors and Other Automotive Sensors in US\$ Million

Chart 200: Glance at 2010, 2015 and 2020 Turkish Automotive Sensors Market Share (%) by Product Segment – Position Sensors, Pressure Sensors, Speed Sensors, Oxygen Sensors, Accelerometers, Rollover Sensors, Temperature Sensors, Yaw Rate Sensors, Mass Airflow Sensors and Other Automotive Sensors

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### Other ROW

Chart 203: Other ROW Automotive Sensors Market Analysis (2010-2020) by Product Segment – Position Sensors, Pressure Sensors, Speed Sensors, Oxygen Sensors, Accelerometers, Rollover Sensors, Temperature Sensors, Yaw Rate Sensors, Mass Airflow Sensors and Other Automotive Sensors in US\$ Million

Chart 204: Glance at 2010, 2015 and 2020 Other ROW Automotive Sensors Market Share (%) by Product Segment – Position Sensors, Pressure Sensors, Speed Sensors, Oxygen Sensors, Accelerometers, Rollover Sensors, Temperature Sensors, Yaw Rate Sensors, Mass Airflow Sensors and Other Automotive Sensors



Chart 205: Other ROW Automotive Sensors Market Analysis (2010-2020) by End-Use Application – Powertrain, Chassis, Safety & Security, Body, Communication & Navigation and Other Automotive Applications in US\$

Chart 206: Glance at 2010, 2015 and 2020 Other ROW Automotive Sensors Market Share (%) by End-Use Application – Powertrain, Chassis, Safety & Security, Body, Communication & Navigation and Other Automotive Applications

### MAJOR GLOBAL MARKET PLAYERS:

Allegro Microsystems, LLC Alps Electric Co., Ltd. AMS AG, Analog Devices, Inc.

Aptina Imaging Corporation Autoliv Inc.,

Borgwarner Beru Systems GmbH Bourns, Inc., Continental AG

CTS Corporation

Custom Sensors & Technologies, Inc.
Delphi Automotive LLP
Denso Corporation,
Elesys North America Inc.
Elmos Semiconductor AG
Freescale Semiconductor, Inc.
GE Measurement & Control Solutions
Hamamatsu Photonics KG
Hella KGaA Hueck & Co.

Hitachi Automotive Systems, Ltd.

Infineon Technologies AG Keihin Corporation

Kistler Group (Kistler Instrumente AG)

Littelfuse, Inc.

Magna International Inc. Magneti Marelli SpA

Maxim Integrated

Melexis NV (Melexis Microelectronic Integrated Systems)

MEMSIC Inc,

Methode Electronics, Inc.

Micronas Semiconductor Holding AG Murata Manufacturing Co Ltd

NGK Spark Plug Co., Ltd.

Novotechnik Messwertaufnehmer OHG

NXP Semiconductors NV Omron Corporation

Osram Opto Semiconductors GmbH

PCB Piezotronics, Inc. Robert Bosch GmbH Schrader International, Inc. Sensata Technologies, Inc. SSI Technologies, Inc. STMicroelectronics Takata Corporation,

TE Connectivity Ltd Texas Instruments Inc.

TRW Automotive Holdings Corp.

TT Electronics PLC Yazaki Corporation

For more information please visit: Global Automotive Sensors Market with Special Focus on MEMS Sensors