

Automotive Electronics

A Profile of International
Markets & Suppliers to 2014

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Report Outline

The eighth edition of "Automotive Electronics – A Profile of International Markets and Suppliers " analyses the market for non-entertainment electronic systems within passenger cars to 2014. It provides an independent, high-level strategic analysis of the technology, applications, markets, forecasts (value and market penetration) and supply companies for the North American, Japanese and West European markets. Twenty five major suppliers are profiled including detailed information on their operations, mergers/acquisitions/strategic alliances, product development and leading financial indicators. A comprehensive directory of the world's leading automotive electronics suppliers, including major global manufacturing facilities completes the report.

Summary of Contents

- Automotive electronics market and technology trends.
- Market penetration by product.
- Market forecasts by product/region to 2014.
- Analysis of automotive market and technology trends.
- Profiles of the leading automotive electronics systems suppliers.
- Global directory of automotive electronic system suppliers.

Product Coverage

- Powertrain (alternators/starters, integrated starter/alternator, engine control, drive-by-wire, transmission)
- Body & Chassis (braking & related systems, driver assistance, steering, suspension, passive restraint);
- Instrumentation & Display; Convenience (security, climate control, body controllers, lighting, wiper systems, power operated systems, navigation/telematics, tyres,)
- Electronic and electrical architecture.

Country Coverage

- West Europe – France, Germany, Italy, United Kingdom, Rest of West Europe.
- North America.
- Japan.

Who will benefit

The eighth edition of "Automotive Electronics – A Profile of International Markets and Suppliers " is essential research for all areas of the electronics and automotive industries including:

Automotive systems & component suppliers – The report provides a detailed independent analysis of the key market trends as well as providing key data for detailed competitor analysis.

EMS – Automotive electronics offers significant opportunities for all tiers of the electronic manufacturing services industry. The report provides information not only on potential customers but also the key trends driving the market in the period to 2014.

Distributors and manufacturers of electronic components and materials - the in-depth profiles and directory provide a detailed analysis of potential customers, highlights growth markets by country/region. Understanding and interpreting the market trends will also be important as this market further develops.

Other organizations which will benefit from the report include:

- Government, including investment organizations.
- Financial and industry analysts.
- Academic institutes & universities tracking developments in the electronics industry.

Automotive Electronics – A Profile of International Markets & Suppliers – the cost effective way to monitor market, industry and company developments.

CONTENTS

LIST OF CONNTENTS

1 INTRODUCTION

2 MANAGEMENT BRIEFING

- 2.1 Automotive Electronics – Market Trends
 - 2.1.1 Overview
- 2.2 Key Trends by Product
 - 2.2.1 Powertrain
 - Engine Control
 - Transmission
 - 2.2.2 Body & Chassis/Safety
 - Braking & Related Systems
 - Driver Assistance
 - 2.2.3 Steering
 - 2.2.4 Suspension
 - 2.2.5 Integration
 - 2.2.6 Passive Restraint/Safety
 - 2.2.7 Convenience
 - Instrumentation & Display
 - Keyless Entry
 - Climate Control
 - Body Controllers
 - Wiper Systems
 - Mirrors
 - Power Operated Systems
 - 2.2.8 Lighting
 - 2.2.9 Navigation
 - 2.2.10 Electronic/Electric Architecture
- 2.3 Market Data
- 2.4 The Major Players
 - 2.4.1 Trends
 - 2.4.2 The Major Players
 - 2.4.3 Major Supplier Summaries
 - Aisin Group
 - Robert Bosch
 - Continental AG
 - Delphi Corporation
 - DENSO
 - Hella KG Hueck & Co
 - Hitachi
 - Hyundai Mobis
 - Johnson Controls
 - Lear Corp
 - Magneti Marelli
 - Mitsubishi Electric
 - TRW Automotive
 - Valeo
 - Visteon
 - 2.4.4 Major Suppliers by Major Product Group

3 AUTOMOTIVE ELECTRONICS MARKET AND TECHNOLOGY TRENDS

3.1 Market and Technology Overview

3.2 Powertrain

3.2.1 Alternators/Starters

- Stop Start Systems

3.2.2 Engine Control

- Ignition

- Fuel Injection

- Gasoline Direct Injection (GDI)

- Engine Management Systems

- Valve Control/Camless Engines

- Electronic Throttle

- Air/Fuel Intake Modules

- Diesel Engine Management

- Flex Fuel Vehicles

- Bi-Fuel Vehicles

- Hybrid Electric Vehicles (HEVs)

- Electric Vehicles

- Fuel Cells

3.2.3 Transmission

- All Wheel Drive

3.3 Body & Chassis/Safety

3.3.1 Overview

3.3.2 Braking & Related Systems

- Anti-Lock Braking Systems (ABS)

- Electronic Stability (ES)

- The move to brake-by-wire

3.3.3 Driver Assistance

- Adaptive cruise control

- Lane Departure Warning/Blind Spot detection

- Night Vision

- Parking Assist

3.3.4 Steering

- Electrically-Controlled Hydraulic

- Electric Power Steering (ESP)

- Four-wheel Steering

- Active Steering

- Steer-by-Wire

3.3.5 Suspension

3.3.6 Passive Restraint

- Pedestrian Safety

3.3.7 Integration of Chassis & Safety Systems

- Electric Corner Modules

3.4 Instrumentation & Display

3.5 Convenience

3.5.1 Keyless Entry

3.5.2 Climate Control

3.5.3 Body Controllers

3.5.4 Automotive Lighting

3.5.5 Wiper Systems

3.5.6 Mirrors

3.5.7 Power Operated Systems

3.5.8 Navigation/Telematics

- Navigation

Telematics

3.5.9 Tyres

Run-Flat Tyres

Tyre Pressure Monitoring

Active Wheel

3.6 Electronic & Electrical Architecture

3.7 Market Data

3.7.1 Economic Overview

3.7.2 Market Penetration

3.7.3 Market Data

3.7.4 Analysis of the North American Passenger Car Market

3.7.5 Analysis of the North American SUV, Pick-Up and Minivan Market

4 AUTOMOTIVE ELECTRONICS SYSTEMS MANUFACTURERS

4.1 Overview

4.2 Major Suppliers

4.3 Profiles of the Major Suppliers

4.3.1 Aisin Group

4.3.2 Robert Bosch

4.3.3 Continental AG

4.3.4 Delphi Corporation

4.3.5 DENSO

4.3.6 Hella KG Hueck & Co

4.3.7 Hitachi

4.3.8 Hyundai Mobis

4.3.9 Johnson Controls

4.3.10 Lear Corp

4.3.11 Magneti Marelli

4.3.12 Mitsubishi Electric

4.3.13 TRW Automotive

4.3.14 Valeo

4.3.15 Visteon

4.4 Other Companies

4.4.1 Alps Electric

4.4.2 Autoliv

4.4.3 Fujitsu Ten

4.4.4 Honda Elesys

4.4.5 Keihin

4.4.6 Magna Electronics

4.4.7 Nexteer Automotive

4.4.8 Omron

4.4.9 Sumitomo Electric

4.4.10 Yazaki

5 DIRECTORY

5.1 Major Manufacturers of Automotive Electronic Systems

6 APPENDICIES

6.1 Car Production by Segment

6.2 Exchange Rates

1 INTRODUCTION

Automotive Electronics - A Profile of International Markets and Suppliers analyses the market for non-entertainment electronic systems within passenger cars. Now in its Eighth edition, the publication has monitored the dramatic growth in the use of automotive electronic systems, a market driven by legislation, customer demand and the benefits electronics bring to the car manufacturer. Continued growth however, will be achieved in a rapidly changing environment. The development of new and emerging markets, the aftermath of the global downturn in automobile production in 2008 and 2009, the impact of ever more stringent emission standards, the move to downsize, the emergence of hybrid and electric vehicles, concentration within the supply industry and the move to a systems approach are just some of the factors which will influence the automotive electronics market as we enter a new decade.

Section 2, the Management Briefing, provides a summary of the key findings of the report.

Section 3 is an overview of the principal market trends within the automotive electronics industry. The chapter looks at key products and applications in the area of powertrain, body and chassis, passenger safety, instrumentation and display and convenience. The market data, included in Section 3, was compiled in May and June 2010, with a forecast through to 2014. The publication does not look at the use of electronics for commercial vehicles or the market for infotainment systems (including communications), both important markets in their own rights.

Information has been obtained through desk research and interviews across all sectors of the industry. Information has also been obtained from relevant associations and government bodies.

Statistics on world car production have been compiled from data from the relevant associations and car manufacturers, with the forecasts based on information from the interview programme and consideration to other monitoring organisations.

The leading electronic system manufacturers are profiled in Section 4, along with details on the structure of the industry. Information for the profiles has been obtained from data supplied by the companies themselves, emarketforecasts.com and from Reed Electronics Research's database. The Reed Electronics Research (RER) database is compiled from company and press sources worldwide.

The directory section covers the major manufacturers of automotive electronic systems worldwide. The information has been obtained via telephone and Internet based research.

Section 7 provides a breakdown of car production by segment and a table of exchange rates against the US dollar.

1.1 Scope

The products analysed for the report have been split into five main areas:

- Powertrain.
- Chassis, body & safety.
- Display and instrumentation.
- Convenience.
- System level.

The principal products within each area are shown below, though consideration has been given to future products in the market forecasts.

POWERTRAIN

- Electronic ignition.
- Electronic alternators/rectifiers.
- Electronic voltage regulators.
- Fuel injection petrol.
- Engine management systems.
- Diesel engine management systems.
- Hybrid & Electric powertrains.
- Electronic throttle (drive-by-wire).
- Electronically-controlled transmission.
- Electronically-controlled all-wheel-drive.

CHASSIS AND BODY

- Anti-lock braking.
- Stability management.
- Driver Assistance.
- Electrically controlled steering.
- Suspension (ride control, semi-active, active).

INSTRUMENTATION AND DISPLAY

- Primary electronic displays (vacuum fluorescent, LCD).
- Electronic drivers for analogue instrumentation.

SAFETY/CONVENIENCE

- Passive restraint airbags, motorised seatbelts
- Automatic climate control.
- Navigation.
- Anti-theft devices (factory installed).
- Keyless entry.

- Central door locking.
- Power windows.
- Wiper modules.
- Power seat.
- Power mirror.
- Power sunroof.
- Lighting.
- Body Controllers.

SYSTEM LEVEL

- Multiplexing/Networking.
- Electrical Distribution

Although electronics is now used extensively on mid-range and smaller cars, the adoption of many electronic systems will remain in the luxury/executive car sectors. To take into account these differences, the report has split car production into five broad segments, though there is considerable product differentiation between each sector. The five segments have been fully revised for the current edition. Consideration has also been given to future changes within each segment.

The segments, with examples, are:

Luxury	- BMW 7 Series, Jaguar, Lexus, Cadillac
Executive	- BMW 5 Series
Medium-upper	- Ford Mondeo, BMW 3 Series
Medium-lower	- Toyota Corolla, Ford Focus, Mazda 323
Small	- Suzuki Alto, Ford Fiesta, Peugeot 106, Nissan Micra

The market data presented in Section 3 of the report represents the value of electronics within the individual systems, at **OEM** prices, and **EXCLUDES** the value of the systems' **SENSORS** and **ACTUATORS**. To indicate real growth, the market estimates have been presented through to 2014 in constant 2009 US dollars.

SAMPLE PAGES

The following section provides sample pages from the new edition of the report.

- **Automatic Windshield Fog Prevention** - An electronic/electromechanical climate control system that predicts potential window glass fogging situations and activates defoggers automatically.
- **Head-up Displays** – The projection of important information onto the windshield to allow the driver to read the data without looking away from the road.
- **Smart Battery** - Maintenance-free vehicle battery that includes electronic features to provide improved safety and security.
- **Electronically Controlled Suspension** - Electronically controlled suspension that improves ride and handling.
- **Electric Power Steering**

Warning State

In the "warning" state, an array of functional alerts serves to aid the driver in recognising detectable threats. Developments in this area include:

- **Collision Warning** - A technology that uses laser, radar, infrared, and long-range sensing devices to provide warnings and/or aid for backing up, forward collisions, blind spots, lane changes, and lane and/or roadway departures.
- **Low Tyre Pressure Warning** - Electronic sensing systems which monitor the vehicle's tyre pressures directly or indirectly through wheel speeds and alert the driver when a tyre pressure is low and may be unsafe for driving.

Collision-Avoidable State

If the potential for vehicle collision is detected and can be immediately avoided, several vehicle control enhancements are available to supplement the driver's actions. Technologies currently being developed or refined in this area include:

- **Collision Avoidance** - Collision avoidance features can be designed to be driver initiated, vehicle initiated, or a combination of the two.
- **Rollover Avoidance System** - A system of sensors which will be able to detect the characteristics of a potential vehicle rollover, then direct the vehicle's chassis control systems to engage appropriate countermeasures.
- **Anti-Lock Braking Systems** - Electronic brake control systems that control wheel slip in order to prevent wheel lock-up during excessive braking for conditions.
- **Vehicle Stability Control** - This chassis control system helps enhance vehicle stability and steerability if the limits of adhesion are exceeded by sensing the driver's desired path compared to the vehicle's actual path.
- **Intelligent Brake Control Systems** - This product family of electronic brake technologies offers power assist, anti-lock braking, traction control, ESP and pedal feel functions.
- **Dynamic Body Control** - This advanced chassis system technology provides interactive control of roll angle during cornering, severe steering manoeuvres and straight-line driving in order to help improve handling, comfort and safety.
- **Complete Chassis Control** - By overseeing and coordinating vehicle subsystems like braking, suspension and steering, Unified Chassis Control enables increased information-sharing, smarter decision-making and coordinated control for the current driving situation.

Collision-Unavoidable State

There are a range of technologies that help optimise occupant protection in front, side and rear collisions as well as vehicle rollovers. These include:

- **Front and Side Airbag Systems.**

- Where the steering rack and pinion meet.
- On the rack.

Steering column systems have the advantage of locating the motor inside the instrument panel, away from the hostile conditions in the engine compartment. They are generally cheaper and lighter and can have the electronics packaged within them. Pinion drive motors can offer better steering precision and feel while rack-drive and belt drive systems have the motor on the rack. The later system is a direct substitute for conventional steering in terms of packaging and offers good road feel and the best potential to go to higher power motors for larger vehicles.

ESP allows the system to be integrated with other control systems and is a critical enabler to start-stop systems, hybrid electric vehicles, and electric vehicles that cannot rely on engine power to provide steering assist at all times.

The system can also be connected with other control functions to provide improved vehicle performance. The Peugeot 207 RC interconnects braking, stability and steering. If the driver brakes when the car has a different grip on either side, the ESP automatically superimposes steering movements onto those applied by the driver to keep the car in a straight line.

Four-wheel Steering

A limited number of cars have adopted four-wheel steering. The system at low speed can reduce the overall turning circle to allow easier parking while at higher speeds the rear wheels turn in the same direction as the front wheels, which improves stability and handling.

Renault's Four Control chassis with four-wheel steering is available on sport versions of the Laguna. According to Renault The Four Control chassis has two main advantages:

- It decreases the turning circle for easier manoeuvring at low speeds,
- It decreases steering wheel angles to give more direct, specially calibrated response.

The Four Control chassis with four-wheel steering influences the dynamic control of the vehicle. A sensor on the steering column sends angle information to the 4WS (four-wheel steering) control unit which also inputs vehicle speed information from the ESC control unit. The 4WS control unit analyses steering wheel angle data to determine the driving style and situation. Based on these parameters, it sets the required angle for the rear wheels, which are turned by means of an electric actuator located on the rear axle. At speeds of less than 60mph, the rear wheels turn in the opposite direction as the front wheels, up to a maximum angle of 3.5°. At speeds of more than 60mph, New Laguna ensures greater precision with enhanced stability.

Active Steering

ZF Lenksysteme, a joint venture between Bosch and ZF Friedrichshafen, has developed a dynamic steering system, Active Steering. The system, which has been developed in conjunction with BMW, embodies some of the essential steer-by-wire functions – such as interconnectivity and signal processing – whilst still retaining the mechanical connection between the steering wheel and the steering gear.

A key feature of the new Active Steering system is an overriding drive. A planetary gear with two input shafts and one output shaft is built into the steering column. One of the input shafts is connected to the steering wheel the other is driven by an electric motor via a worm gear functioning as a speed transformation device. The associated software processes the necessary sensor signals, controls the electric motor and monitors the whole steering system. The electric motor and the overriding drive allow a steering impulse to be transmitted to the front axle

Table 3.6 West European Market Penetration by Selected Electronic Products 2009-2014 (%)

%	2009	2012	2014
Alternators			
Engine Management Systems			
Diesel Engine Management Systems			
Hybrid/Electric			
Automatic Transmission			
ECVT			
Electronic Manual Gearbox			
ABS			
Stability Management			
Electrically Controlled Steering			
Suspension			
Automatic Climate Control			
Airbag - Driver			
Airbag - Passenger			
Airbag - Side Curtain			
Keyless Entry			
Adaptive Front Lighting			
Adaptive Cruise Control			
Lane Departure Warning			
Blind Spot Detection			
Night Vision			
Collision Avoidance			
Map enabled Driver Assistance			
Power Windows			
Power Mirrors			
Power Sunroof			
Power Seat			
Wiper Modules			
Navigation			

The following tables provide more detailed information on the automotive electronics market including breakdowns by region and product and estimates of the market by vehicle segment. North America refers to the USA, Canada and Mexico and includes passenger cars and light commercial vehicles (minivans, SUVs, pick-up trucks). **Please note that all tables are subject to computer rounding.**

Table 3.7 North American Automotive Electronics Market by Product

US\$ Millions	2009	2010	2012	2014	Growth Per Annum
Powertrain					
Body/Chassis					
Instrumentation					
Safety/Convenience					
Total					

Table 3.8 Japanese Automotive Electronics Market by Product

US\$ Millions	2009	2010	2012	2014	Growth Per Annum
Powertrain					
Body/Chassis					
Instrumentation					
Safety/Convenience					
Total					

Table 3.9 West European Automotive Electronics Market by Product

US\$ Millions	2009	2010	2012	2014	Growth Per Annum
Powertrain					
Body/Chassis					
Instrumentation					
Safety/Convenience					
Total					

Table 3.10 West European Automotive Electronics Market by Region

US\$ Millions	2009	2010	2012	2014	Growth Per Annum
Germany					
France					
UK					
Italy					
Rest of Western Europe					
Total					

Sumi Motherson – In January 2008, Magneti Marelli and Sumi Motherson Group signed an agreement for the creation of a 50/50 joint venture in India aimed at the production of automotive components in the area of lighting and engine control systems. The industrial facilities are located in the areas of New Delhi and Pune.

Suzuki Motor Corporation/Maruti Suzuki India Limited - Magneti Marelli, Suzuki Motor Corporation and Maruti Suzuki India Limited signed an agreement in October 2007 for the creation of a joint venture in India, aimed at the production of electronic control units for diesel engines. According to the agreements, Magneti Marelli holds 51% of the new company, Magneti Marelli Powertrain India Private Limited, Suzuki 30% and Maruti 19%. The initial investment in the venture was expected to total approximately Euro 15 million. The industrial activities will be located in Manesar - in the industrial district of Gurgaon. Capacity at the plant, which was scheduled to start production at the end of 2008, is approximately 500,000 control units per year.

Telit Communications – In December 2009, Magneti Marelli and Telit Communications SpA signed a Memorandum of Understanding in the area of GSM and GPRS modules to be used on telematics devices in the automotive market. The agreement aims at developing info-mobility and tracking functions and services, and specifically provides for Telit to supply Magneti Marelli with cellular M2M (machine-to-machine) modules to be fitted into telematics boxes for automotive use worldwide and in particular for Europe and Brazil.

Unitech Machines Ltd – In September 2008, Magneti Marelli signed an agreement with the Indian group Unitech Machines Ltd to establish a joint venture for the design, manufacture and assembly of electronic automotive components.

Product Development

Key electronic products produced by Magneti Marelli include:

Electronic Systems Division

- Instrument clusters & displays.
- Full multimedia & navigation.
- Driver assistance systems.
- Telematics & consumer electronics.
- Body electronics (body computer, climate controls, lighting, adaptive suspension etc).

Engine Control

- ECUs for gasoline, diesel and alternative fuel vehicles.

Suspension Systems

- Intelligent damping control.

Lighting

- LED lighting.
- Xenon lighting.
- Adaptive front lighting.
- Automatic levelling control.

In the area of engine control development work is focusing on the development of new products and technologies for hybrid vehicles, bio-fuels and low-consumption gasoline and diesel engines.

TRW has developed a new slip control unit with integrated inertial sensors which mitigates many of the interface and organizational issues of integrating signals from stand alone inertial sensor modules. This approach eliminates many components and can thereby realize significant cost savings.

TRW's integrated Electric Park Brake (EPBi) system, also eliminates the need for a separate ECU due to its integration with the ESC system. In addition to realizing cost savings, EPBi also offers enhanced functionality, as it can seamlessly integrate the functionality of an electric park brake with a hydraulic service brake in order to optimize features such as drive away assist and hill hold.

TRW's regenerative braking systems ESC-R and Slip Control Boost (SCB) provide full stability control and work seamlessly within a hybrid system to provide brake blending between the friction brake system and the deceleration provided by the electric motor. Regenerative braking is used in full hybrid powertrains to recover brake energy to help recharge the batteries rather than dissipating the energy through heat in the friction brakes.

TRW's Automatic Emergency Braking (AEB) system can utilize Long Range Radar (LRR) or Medium Range Radar (MRR) in combination with a video camera (usually mounted behind the rear view mirror facing forward through the windshield). These sensors independently gather data - the LRR or MRR looks forward in a long but narrower field of view while the camera covers a wider field of view and helps detect and classify objects such as other vehicles.

The data gathered by each of these sensors is fed to the control unit and is constantly compared every 40 milliseconds in what is called data fusion. Both sensors need to independently verify the criticality of a foreseeable crash and confirm that AEB should be deployed. The rapid deceleration of the vehicle can then be accomplished through the use of a premium electronic stability control unit that can build high levels of brake pressure quickly.

TRW announced in September 2009 a newly enhanced motor pump unit as part of the Electrically Powered Hydraulic Steering system (EPHS) on selected new Mercedes-Benz models. With TRW's motor pump unit, hydraulic assist is determined by the pump speed and controlled by a patented, brushless motor which provides assist only when it is needed. The system used on the various Mercedes models uses TRW's newest high power motor pump assembly providing a hydraulic output power of up to 1,000 watts. Compared with traditional hydraulic power steering, the system also offers fuel savings of up to 0.29L/100km and a reduction of carbon dioxide emissions of approximately 6g/km.

TRW's motor pump unit provides flexible tuning capability allowing the system to adapt to different driving conditions, providing a comfortable setting for parking and city driving, while delivering a safe and robust feel at higher speeds. There is also the option for EPHS to vary assist levels depending on the vehicle loading information provided by other vehicle subsystems.

EPHS is ideal for HEVs as a technology that can be used across both the conventional and hybrid powertrain platforms, reducing application engineering costs. The technology can also be applied to existing hydraulic power steering systems in order to meet short term CO2 requirements. In this case, the mechanical pump is substituted by TRW's EPHS motor pump unit technology.

Electrically assisted steering systems are a critical enabler to start stop systems, hybrid electric vehicles, and electric vehicles that cannot rely on engine power to provide steering assist at all times.

In November 2008, TRW announced it was launching its rack drive steering on Ford's flagship passenger car models. Rack drive steering technology, also referred to as 'EPS belt drive', brings the fuel efficiency and carbon dioxide reduction benefits of an electric steering system to higher rack load vehicles as compared to TRW's current column drive EPS system, already launched on more than 30 vehicle models. As with all TRW electromechanical steering systems, the rack drive system only consumes noticeable power when steering assist is needed. The energy consumption of an EPS system is typically less than 7% of a conventional hydraulic rack

- Xiamen, China (JV)
- Zhangjiagang, China

Engineering/product development/sales facilities are located in:

- Brampton, Ontario, Canada
- London, Ontario, Canada
- Troy, Michigan, USA
- Rochester Hills, Michigan, USA
- Holly, Michigan, USA
- Gothenburg, Sweden
- Sindelfingen, Germany
- Munich, Germany
- Cologne, Germany
- Sailauf, Germany
- Walschut-Tiengen, Germany
- Bangalore, India
- Tokyo, Japan
- Nagaya, Japan

Acquisitions have played an important part in the development of the company.

In October 2008, Magna Electronics announced the acquisition of BluW v Systems LLC, a developer and supplier of electric and energy-management systems for hybrid electric vehicles, plug-in hybrid vehicles and battery electric vehicles. Located in Rochester Hills, Michigan BluW will enable Magna to bring electric/hybrid-vehicle systems to market faster, while simultaneously developing the next-generation of products. BluW's products were grouped into three distinct segments that together provided more than 80% of the propulsion system content for hybrid electric, plug-in and fully electric vehicles.

In February 2008, Magna Electronics announced it had acquired Troy, Michigan-based, Allied Transportation Technology Inc. Allied produced ultrasonic sensing systems used for parking assistance and back-up object detection.

Also in February 2008, Magna Electronics announced it had acquired the Zhangjiagang Suxing Electronics facility located in Zhangjiagang, Jiangsu province, China. The facility, Magna Suxing Electronics, manufactures products such as body control modules for China and other markets.

In February 2007, Magna Electronics completed the acquisition of Italamec Srl in Campiglione, Italy and Wehrle Autoelektronik GmbH in Waldshut-Tiengen, Germany. The two acquisitions strengthened the company's development and production expertise as well as its manufacturing presence in Europe.

Italamec's principal products included electronic control units, relays and mechanical systems for the automotive industry in the fields of passenger cars and commercial vehicles, while Wehrle's principal products included glow plug control units, liquid level sensors, displays and electronic control units.

In 2010, Magna International formed a new business unit Magna E-Car Systems, which pools together the company's various electro-mobility competences on a global basis. The goal of Magna E-Car Systems is to become the world's leading engineering and manufacturing partner for hybrid and electric cars.

Its services range from the development of complete vehicle concepts, via system integration and system and module engineering, to the development and production of lithium-ion battery systems for hybrid and electric vehicles.

5 DIRECTORY

5.1 Major Manufacturers of Automotive Electronic Systems

Company: **AB AUTOMOTIVE INC**

Address: PO Box 2240, 2500 Business Highway 70 East, Smithfield NC 27577, USA

Tel: +1 919 934 5181

Fax: +1 919 934 5186

Website: www.abautomotiveusa.com

Principal Electronic Products: Sensors (chassis height, throttle position, pedal position, EGR valve etc); Climate control electronics and systems; Connectors

Parent Company: TT Electronics plc, Clive House, 12/18 Queens Rd, Weybridge, Surrey, KT13 9XB, UK

Group Sales: £499.6 million (2009)

Note: Production of automotive electronics being phased out

Company: **AB ELEKTRONIK GMBH**

Address: Kloecknerstrasse 4, 59368 Werne, Germany

Tel: +49 2389 788 213

Fax: +49 2389 788190

Website: www.abelektronik.de

Principal Electronic Products: Automotive sensors

Parent Company: TT Electronics plc, Clive House, 12/18 Queens Rd, Weybridge, Surrey, KT13 9XB, UK

Group Sales: £499.6 million (2009)

Company: **AB ELEKTRONIK SACHSEN GMBH**

Address: Salzstrasse 3, 01738 Klingenberg, Germany

Tel: +49 35 202 5730

Fax: +49 35 202 57401

Website: www.ab-sachsen.com

Principal Electronic Products: Automotive sensors

Parent Company: TT Electronics plc, Clive House, 12/18 Queens Rd, Weybridge, Surrey, KT13 9XB, UK

Group Sales: £499.6 million (2009)

Company: **ADVICS CO LTD**

Address: 2-1 Showa-cho, Kariya, Aichi 448-8688, Japan

Tel: +81 566 63 8000

Fax: +81 566 22 8021

Website: www.advics.co.jp

President: Dr H Saito

Consolidated Sales: Yen 359.5 billion (31 March 2009)

Principal Electronic Products: Development and sale of ABS, stability control and hydraulic brakes and related components

North American Address: Advics North America, 45300 Polaris Court, Plymouth, MI 48170, USA

Tel: +1 734 414 5100

Fax: +1 734 414 5110

R&D and sale of automotive brake systems and components

ADVICS North American Sales: US\$747 million (2008)

Employees: 114 (2008)

Other Manufacturing Locations:

ADVICS Manufacturing Ohio, Inc.

Address: 1650 Kingsview Drive Lebanon, Ohio 45036, U.S.A.

Tel: +1 513 932 7878

Fax: +1 513 932 9073

Company: **ZF FRIEDRICHSHAFEN AG**

Address: Graf-von-Soden-Platz 1, 88046 Friedrichshafen, Germany

Tel: +49 7541 77 0

Fax: +49 7541 77 90 8000

Website: www.zf.com

CEO: H-G Harter

Group Sales: Euro 9.4 billion (2009)

Group Employees: 60,480 (2009)

Principal Electronic Products: Transmission, Steering, Suspension, Electronic components (see below)

Company: **ZF ELECTRONICS GMBH**

Address: Cherrystrasse, 91275 Auerbach/OPF, Germany

Tel: +49 9643 18 0

Sales: Euro 208 million (2009)

Principal Automotive Products: Switches, Switches with wire harnesses; Switches with integrated connector;

Sensors; Electronic control units (seat, electro hydraulic systems; window lifts, tailstack

ZF Electronics UK, Ltd

Address: Unit L, Airport Executive Park, President Way, Luton, Beds LU2 9NY, United Kingdom

Tel: +44 1582 506140

Fax: +44 1582 506176

ZF Electronics France S.A.R.L.

Address: 1, avenue des Violettes, Z.A. des Petits Carreaux, 94384 Bonneuil sur Marne cedex
France

Tel: +33 1 43 77 29 51

ZF Electronics Klášterec s.r.o.

Address: Osvobozena 780, 431 51 Klášterec nad Ohri, Czech Republic

Tel: +420 474 359 111

North American Office

Address: 11200 88th Avenue, Pleasant Prairie, IL 53158, USA

Tel: +1 262 942 6500

Cherry de Mexico SA de CV

Address: Valle de Los Cedros, # 1650, Pargue Industrial Intermex, CD Juarex, Chihuahua, Mexico

Cherry Australia Pty Ltd

Address: Unit 5, 15116 Nicole Close, Victoria, Australia

Tel: +61 3 9761 7844

TVS Cherry Ltd

Address: Madurai-Meipur Road, Vallaripatti, Madurai 625122, India

Tel: +91 452 822761

ZF Electronics Asia

Address: 13/F Block A, North Point Industrial Building, 499 King's Road, North Point, Hong Kong

Tel: +852 2565 6678

Parent Company: ZF, Germany

Note: Formerly Cherry Corp acquired by ZF in 2008

Company: **ZF LENKSYSTEME GMBH**

Address: Richard-Bullinger-Strasse 77, 73527 Schwäbisch Gmünd, Germany

Tel: +49 7171 310

Fax: +49 7171 31 3222

Website: www.zf-lenksysteme.com

CEO: E Behle

Group Sales: Euro 2,197 million (2009)

Principal Electronic Products: Electrically controlled steering

Note: Joint venture with Robert Bosch

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