The inertial sensor market for consumer and automotive will see healthy 15% growth this year to surpass $2.6 billion, thanks to the increasing penetration of more motion sensing into more mobile devices, and more automotive safety systems in more cars across the globe. Though unit growth will continue at double digit rates, maturing markets and continued price erosion means sales revenues from discrete inertial sensors will level off and start to decline over the next several years. Growth will then come largely from combination sensors, which we project will jump from very tiny volumes currently to penetrate some 40% of the $2.7 billion consumer inertial market and more than 12% of the $1.1 billion automotive inertial market by 2016. This report is focused on the analysis of the opportunities and the challenges for inertial combo sensors in those high-volume market areas. One clear motivation for combo sensors is the possibility to reduce both cost and footprint by combining the two sensors into one package with a single ASIC. However this cost benefit is not yet obvious with the dynamism of the evolution of each individual sensor. Such benefit will be very application dependent. Lower cost units combining multiple MEMS sensors are poised for healthy growth, starting with eSCs, bringing opportunity for new players and demands for sensor management solutions. This trend is showing up first in the more mature automotive MEMS sector, where the price of the sensor unit for the electronic stability control system (ESC) can now be significantly reduced, by combining the accelerometer and the gyroscope in one package with one ASIC. Adoption is a little slower on the consumer side, where the fast changing technology means discrete device prices are still falling rapidly, so products from even six months before have less of a cost advantage. But the consumer market’s fast model turnover and short replacement cycles means that once the economics become compelling and adoption starts in 2012-2013, market penetration will be faster and deeper than on the automotive side.

We expect big changes as well in the supply chain, as prices will continue to drop, and a host of players along the complex new value chain all scramble to figure out how best to compete and cooperate for the much bigger business of integrating the silicon sensors into useful functions. Despite the complexities of designing and fabricating MEMS devices, most of the value in these functions is not actually in the fabrication of the MEMS die. ASIC, packaging, test & calibration and software production costs make up a significant part of the cost, and this will gain importance with the trend for multi-sensor packages.
To provide a complete overview of the market data for consumer and automotive motion sensors:
- Unit shipments and revenues by type of sensor
- Average selling price analysis and expected evolution
- Market shares with detailed breakdown for each player and major OEM contracts

To provide an analysis on the potential for combo sensors for each category of application:
- Functions that are used, new features and specification requirements linked to combo sensors
- Which driver for combo sensors, when will it start?
- Penetration of combos and market forecasts for each type of use

To provide a deep analysis on the challenges and opportunities for combo sensors in consumer electronics and in automotive:
- Description of the different types of combo sensors
- Motivation for sensor fusion: from a sensor to a solution. Key software providers
- Different levels of processing and strategies for integration in the system (MCU...)
- Insight about future technology trends & manufacturing challenges linked to the emergence of combos: evolution of front-end MEMS manufacturing, new packaging technologies...

To provide a clear understanding of motion sensor value chain, infrastructure & players for consumer and automotive business:
- Exhaustive list of players for each device under consideration, status of development
- Analysis on the new players and potential new entrants with MEMS technology
- Analysis on the position and strategy of the main players related to combo sensors (16 key players: ST, InvenSense, Bosch, VTI...) according to 7 criteria
- Description of the value chain, evolution of the value for each step: design, front-end, assembly, test, software impact of the technical evolutions

REPORT OUTLINE

- MEMS accelerometers, MEMS gyroscopes, Magnetometers
- Worldwide market metrics: 2009-2016 market ($M, M units, ASP)
- 2010 market shares, 2011 trends
- 12+ key groups of application for motion sensors are described in consumer
- 6+ key groups of application for motion sensors are described in automotive
- Market dynamics, Technical trends, Key players, Market forecasts for each application
- 150+ companies included in the report
- Report is a 290 slide PowerPoint presentation
- Detailed Excel datasheet included

BIO

Laurent Robin is in charge of the MEMS & Sensors market research at Yole Developpement. He previously worked at image sensor company e2v Technologies (Grenoble, France). He holds a Physics Engineering degree from the National Institute of Applied Sciences in Toulouse, plus a Master Degree in Technology & Innovation Management from EM Lyon Business School, France
MEMS & sensor suppliers
- Evaluate market potential of future technologies and products for new application markets
- Understand the differentiated value of your products and technologies in this market
- Build roadmap for combo sensors: which type of combo? When?
- Identify new business opportunities for combo sensor
- Monitor and benchmark your competitor’s advancements

MEMS & packaging foundries, test houses
- Understand the applications that will drive the volumes in 2016
- Identify new business opportunities and prospects

Mixed-signal companies & ASIC manufacturers, Software specialists
- Spot new opportunities and define diversification strategies

Consumer Electronic OEMs, Automotive Tier 1 companies
- Evaluate market potential of future technologies and products for new application markets
- Evaluate the benefits of using these new technologies in your end system, design architectures for the next generation of systems
- Screen potential new suppliers able to provide new functionalities, or cost and size savings

R&D centers
- Understand how the new front-end and packaging technologies will impact the future business
- Evaluate market potential of future technologies and products for new application markets
- Identify the best candidates for technology transfer

Financial & strategic investors
- Understand the structure and value chain of the consumer and automotive motion sensing industry
- Estimate the potential of new devices such as 9DOF combo sensors...
- Get the list of the main key players and emerging start-ups of this industry worldwide

WHO SHOULD BUY THIS REPORT?

COMPANIES CITED IN THE REPORT:

ORDER FORM

PLEASE ENTER MY ORDER FOR “Inertial Combo Sensors for Consumer & Automotive”
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*For price in dollars please use the day’s exchange rate. All reports are delivered electronically. For French customers, add 19,6 % for VAT

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(1) Our Terms and Conditions of Sale are available www.yole.fr/terms_and_Conditions_of_Sale.asp
The present document is 24 months after its publishing date: 20th October 2011.

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ABOUT YOLE DÉVELOPPEMENT

Beginning in 1998 with Yole Développement, we have grown to become a group of companies providing market research, technology analysis, strategy consulting, media in addition to finance services. With a solid focus on emerging applications using silicon and/or micro manufacturing Yole Développement group has expanded to include more than 50 associates worldwide covering MEMS, Microfluidics & Medical, Advanced Packaging, Compound Semiconductors, Power Electronics, LED, and Photovoltaic. The group supports companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

CUSTOM STUDIES
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More information on www.yole.fr

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☐ Critical news, bi-weekly: Micronews, the magazine
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TERMS AND CONDITIONS OF SALE

Definitions: “Acceptance”: Action by which the Buyer accepts the terms and conditions of sale in their entirety. It is done by signing the purchase order which mentions “I hereby accept Yole’s Terms and Conditions of Sale”.

“Buyer”: any business user (i.e. any acting in the course of its business activities, for its business needs) entering into the following general conditions to the exclusion of consumers acting in their personal interests.

“Contracting Parties” or “Parties”: The Seller on one hand and the Buyer on the other hand.

“Information” means any information, data, facts, figures, statistics, contents, reports, or the like purchased or viewed by the Buyer in Yole’s Products.

“License” for the reports and databases, 3 different licenses are proposed. The buyer has to choose one license:

1. Single license: a single individual at the company can use the report.
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“Products”: Depending on the purchase order, reports or database on MEMS, CSC, Optics/MEMS, Nano, bio, … to be bought either on a unit basis or as an annual subscription, (i.e. subscription for a period of 1 year, with delivery of a new annual subscription to a package (i.e. a global discount based on the number of reports that the Buyer orders or accesses via the service, a global search service on line on i-micronews and a consulting approach), is defined in the order. Reports are established in PowerPoint and delivered on a PDF format and the database may include Excel files.

“Seller”: based in Lyon (France headquarters), Yole Développement is a market research and business development consultancy company, facilitating market access for advanced technology industrial projects. With more than 20 market analysts, Yole works worldwide with the key industrial companies, R&D institutes and investors to help them understand the markets and technology trends.

1. Scope

1.1 The Contracting Parties undertake to observe the following general conditions when agreed by the Buyer and the Seller. ANY ADDITIONAL, DIFFERENT, OR CONFLICTING TERMS AND CONDITIONS IN ANY OTHER DOCUMENTS ISSUED BY THE BUYER AT ANY TIME ARE HEREBY OBSTRUCTED TO BY THE SELLER, SHALL BE WHOLLY INAPPLICABLE TO ANY SALE MADE HEREUNDER AND SHALL NOT BE BINDING IN ANY WAY ON THE SELLER.

1.2 This agreement becomes valid and enforceable between the Contracting Parties after clear and non-equivalent consent by any duly authorised person representing the Buyer. For these purposes, the Buyer accepts these conditions of sales when signing the purchase order which mentions “I hereby accept Yole’s Terms and Conditions of Sale”. This results in the Buyer understanding that the normal exclusions of liability for breach of contract do not apply to the Buyer.

1.3 Orders are deemed to be accepted only upon written acceptance and confirmation by the Seller, within [7] days from the date of receipt, to be either sent by email or to the Buyer’s address. In the absence of written acceptance, orders shall be deemed to have been accepted.

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2.1 Products are sent by the Buyer to the Seller:

- within [1] month from the order for Products already released or
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2.2 Some weeks prior to the release date the Seller can propose a pre-release discount to the Buyer.

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2.4 No return of products shall be accepted without prior information to the Seller, even in case of delayed delivery. Any product returned to the Seller, without providing prior information to the Seller as required under article 2.5 shall remain at the Buyer’s risk.

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3.1 Prices are given in the orders corresponding to each product sold on a unit basis or corresponding to annual subscriptions. They are expressed to be inclusive of all taxes. The prices may be reevaluated at any time. The effective price is deemed to be the one applicable at the time of the order.

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Account n°: 0176 200 1565 87
BIC or SWIFT code: CCEPPAR
IBAN: FR76 3005 6001 7001 7002 0156 587

3.4 The Seller reserves the right to request down payments from the Buyer: In this case, the need of down payments will be mentioned on the order.

4. Price, invoicing and payment

4.1 The Buyer may release the products for its business activities, shall be solely responsible for choosing the Products and for any representation or indication in the documents it purchases, of the results he obtains, and of the advice and acts it deduces thereof.

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- damages of any kind, including without limitation, incidental or consequential damages (including, but not limited to, damages for loss of profits, business interruption and loss of programs or information) arising out of the use or inability to use the Seller’s website or the Products, or any information saved on the website, or in the Products;
- any claim attributable to errors, omissions or other inaccuracies in the Product or interpretations thereof.

4.4 All the Products sold by the Seller have been obtained from sources believed to be reliable. The Seller does not warrant the accuracy, completeness adequacy or reliability of such information, which cannot be guaranteed to be free from errors.

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4.7 The deadlines that the Seller is asked to state for the mailing of the Products are given for information only and are not guaranteed. If such deadlines are not met, it shall not lead to any damages or cancellation of the orders, except for non acceptable delays exceeding [4] months from the stated deadline, without information from the Seller. In such case only, the Buyer shall be entitled to ask for a reimbursement. The Buyer’s reimbursement shall be limited to the evidence of any further damages.

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- Recordings and retransmit to any network (including any local area network);
- Use any timesharing, service bureau, bulletin board or similar arrangement or public display;
- Posting any Product to any other on line service (including bulletin boards or the Internet);
- Leasing, lending, offering for sale or assigning the Product.

5.3 The Buyer shall be solely responsible towards the Seller of all infringements of this obligation, whether this infringement comes from its employees or any person to whom the Buyer has sent the Products and shall personally take care of any related proceedings, and the Buyer shall bear related financial consequences in their entirety.

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6.1 If the Buyer cancels the order in whole or in part or postpones the date of mailing, the Buyer shall indemnify the Seller for the entire costs that have been incurred as at the date of notification by the Buyer of such delay or cancellation. This may also apply for the Buyer if any other direct or indirect consequential loss that may be borne by the Seller, following this decision.

6.2 All reports and databases remain the property of the Seller and may be used only under the non-exclusive licence to which they have been subject to. The Buyer may not make any piratical copy of such reports and databases, and shall not make available to third parties.

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7.2 If the Buyer infringes the order of the terms in which the Buyer is required put in order to inform the Buyer by recorded delivery letter upon which, after a period of thirty (30) days without solving the problem, the non-breaching Party shall be entitled to terminate all the pending orders, without being liable for any compensation.

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8.2 Any dispute arising under these Terms and Conditions shall be given in writing. They shall be effective upon receipt by the other Party.

8.3 The Seller may, from time to time, update these Terms and Conditions and the Buyer is deemed to have accepted the latest version of these terms and conditions, provided they have been communicated in due time.

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9.1 Any dispute arising out of or linked to these Terms and Conditions or to any contract (orders) entered into in application of these Terms and Conditions shall be settled by the French Commercial Courts of Lyon, which shall have exclusive jurisdiction upon such issues.

9.2 French law shall govern the relation between the Buyer and the Seller, in accordance with these Terms and Conditions.