



Sensors for the future

With multiple sensor categories gaining traction amid the current recessionary times, this feature analyses the various new age applications and technologies that are making the rounds in the Indian sensor segment and suggests the themes of future developments in this domain.



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As per recent reports, the Indian sensor market is growing rapidly with the fastest growing segments being gas sensors, image, accelerometers and position sensors. Continuous technological innovation and increasing application areas for these new age sensors are pushing their demand in the market. With this in the backdrop, the sensors market is expected to grow at the CAGR of 14% till 2018. Analysing the current technology trends that are satisfying the need for innovative products and futuristic technologies in the Indian market are industry experts – Johann Salzberger, Managing Director – Marketing and Sales, Micro-Epsilon; Ravi Agarwal, Director, Pepperl+Fuchs (Factory Automation); Sunil Hasabnis, Managing Director, Baumer India; Bipin Jirge, Managing Director, ifm electronic India Pvt Ltd; Deepak Aran, Country Manager – Sales & Marketing, Contrinex Automation Pvt Ltd; Deenar Patil, Senior Manager – Key Accounts, Schmersal India; and Vikrant Agashe, Sales Manager – Sensors & Components, Gefran India.

Technology landscape

Globally, the sensor technology has changed from purely electrical transducers to mechatronic-based systems. Commenting on this, Salzberger notes, “This means, today sensors are equipped with more electronics and integrated intelligence, micro-computers and software. In terms of measurement principles, the importance of optical, laser sensor systems and vision technology is constantly increasing.” In today’s scenario, every sensor company is also focusing on smart & miniaturisation technology coupled with designs amenable to modern production techniques that ensure least human error and improve overall product reliability. There is also a growing trend towards developing industry specific sensors. Highlighting this, Hasabnis says, “Advanced sensing technologies are offered for edge, positioning, profile measurement & sensing applications at higher speeds & accuracies which were not possible till date. Some latest design

trends include Internet bus communication; analogue output; modular & flexible designs and IP rating up to IP 69K." Adding to his thoughts, Agarwal points out, "There seems to be a paradigm shift along two streams. Traditional domain of industrial sensing is seemingly pushing for sensors to be smarter and communicating. Not only are the sensors being expected to measure absolute value of the parameter but also to effectively communicate it into the network. This is also impacting diagnostics, interoperability and machine/process/network design and management. In the embedded technology, MEMS which relates to motion and orientation sensing is doing wonders."

Market demand-supply position by 2015

The demand is increasing for automation, safety & control devices as users now demand more safe solutions. Asserting this, Patil avers, "By 2015, the market demand will increase as the machines are getting smarter with minimum wiring between control system and field sensors. Now, control devices for cranes/hydraulics press machines can be controlled remotely, safely and efficiently." Sharing his views, Hasabnis avers, "Market demand and supply position address and meet the changing customer profile. On one hand, demand for automation & sensing products is increasing even under difficult economic conditions in sheer volume terms. However, other side of the same trend is increasing pressure on price and number of 'me too' products offered at ridiculously low prices. On the positive side, there is increasing trend towards global standard suppliers by all the major global OEMs and end users." Adding further he says, "The trend towards 2015 is definitively that technology gap among different manufacturers will narrow and great companies will get more distinguished by value addition they offer rather than just the product & price." Adding to this, Salzberger says, "The future market will need more sensors in general and more sophisticated sensor solutions in particular. In the field of displacement measurement different sensor technologies will be required, because there is no universal measuring principle which can solve the whole variety of measuring tasks. There will be a trend to more integration, more miniaturisation and more intelligence."

Factors influencing technology developments

New age industrial and consumer products consistently



"The future trend will be towards more integration, miniaturisation and intelligence"

Johann Salzberger, Managing Director - Marketing and Sales, Micro-Epsilon



"Speed, reliability and consistent performance in an application are the governing factors for proven solutions"

Ravi Agarwal, Director, Pepperl+Fuchs (Factory Automation)



"The future of wireless technology will much depend on the reliability they can offer in the field"

Sunil Hasabnis, Managing Director, Baumer India



"By 2015, the market demand will increase as the machines are getting smarter with minimum wiring between control system and field sensors"

Deenar Patil, Senior Manager - Key Accounts, Schmersal India

throw challenges for manufacturing and automation. Elaborating on the market factors that are influencing sensor technology developments, Agarwal explains, "Speed, reliability and consistent performance in an application are the governing factors for proven solutions. The cutting edge designs are pushing for detection and measurement." On similar lines, Aran says, "Major influencing factors are the latest communication protocols of automation, environmental conditions of sensing applications and the economy. Technocrats want sensors which are compatible with latest communication protocols, sensors with high accuracy, able to work in high temperatures, pressures and all sorts of environment like underwater, space, etc and at competitive prices." As per Agashe, the influencing market factors include competitive differentiation. He notes, "Over the past few years, a number of developments in the industrial sector have facilitated low-cost sensor solutions. Reduced operating costs, enhanced performance and a high return on investment all drive technology development." Summarising the factors for new product development, Hasabnis says, "Product versatility

for different applications; compact size; low-cost manufacturing cost; reliability & one box design; exactly engineered products; better cost to performance ratio; shift towards robust technologies such as magnetic; wireless technologies; and user-friendly internet connectively for monitoring control and configuration of the sensor, are the major factors influencing the sensor technology developments.” Thus, as per Jirge, with the Indian market accepting appropriate automation levels in many industries, as the market develops further, the demand or the acceptance for higher technology sensors will only increase. This will lead to development of complex sensors at more affordable price points with the growing market.

Sensors gaining market traction

So, with multiple reasons for new technology development, which type of sensors will be gaining traction in the current market scenario? Answering this, Aran points out that apart from higher expectations from inductive and photoelectric sensors, a lot of interest and thrust is seen on RFID Identification sensors. Elaborating in brief on the topic, Agashe asserts, “The future of sensors is highly dependent on sensor technologies such as microelectromechanical system sensors, wireless sensor, radar and many more. Hasabnis adds, “Inductive sensors with extended sensing distance; smart vision sensors with integrated programming and software; smart diffused with background suppression photo electric sensors; advanced measurement sensors; linear & inclination sensors used for position sensing; position & speed sensing in one unit; and programmable sensors in field of colour mark are some of the sensors which are gaining traction in the current market scenario.” Also, as per Jirge, position and fluid parameter sensors are gaining more acceptance, while for Agarwal, photo sensor and ultrasonic technologies are turning out to be more coveted solutions in the current market scenario.

Future roadmap of smart technologies

With many companies introducing the ‘smart’ factor into sensors and wireless sensor networks, how does the future roadmap for these new age sensors look like? Answering this, Agarwal suggests, “Although the adoption has been slow due to inherent needs of such platforms, they are here to stay. Sensors necessarily would need to and are already becoming smart. Industry 4.0 and cyber physical systems are no more very



“The technology trend being adopted by the sensor industry is towards smaller, faster, and cheaper solutions”

Vikrant Agashe, Sales Manager – Sensors & Components, Gefran India



“Sensors are becoming more intelligent & capable of taking decisions locally”

Bipin Jirge, Managing Director, ifm electronic India



“2015 will see more requirement of special sensors, though standard sensors will continue to enjoy the current status as automation basics will remain the same”

Deepak Aran, Country Manager – Sales & Marketing, Contrinex Automation

distant but are already a future in the making.” Aran notes, “There is limited response to smart sensors due to various reasons like adaptation to existing system, environmental interference, etc. But the future of these sensors is definitely bright. These sensors will eliminate many problems related to hard wired connectivity when the technology is improved and proven further.” On the other hand, Agashe believes, “High-capacity wireless sensor networking is still an emerging technology. The existing systems need enhancements in terms of real-time performance. As the technology is new, the cost is too expensive to adapt.” Making his point, Hasabnis suggests, “The future of wireless technology will much depend on the reliability they can offer in the field. Smart technologies such as sensors without reflectors, tape encoders which offer easy retrofitting and much accurate feedback are much in demand. In other words, market prefers technologies that are advancing in linear continuity over the past product line.” Adding his thoughts, Jirge says, “As on today, we have not seen large scale use of wireless sensors, but as the battery technology improves, we will certainly see more and more sensors going wireless.”

With the sensor market rampantly scaling up on the technology & innovation front, and the demand for various categories of sensors going up amid sluggish growth in the manufacturing sector, the growing momentum of the Indian sensor market is likely to continue during the 2015-16 period. □

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