

# Pushing past technology limits

“The only limitation with new technologies is your imagination,” claims Jean-Yves Gomez, CEO at France-based Isorg. In OPE journal, the sensor specialist presents an update on its latest developments

Isorg is considered to be the pioneer in organic photodetectors (OPD) and large-area image sensors. The company prides itself in its core competences of OPD sensor technology and optics design and aims to become the leading provider of large-area organic image sensor solutions.

Today, Isorg provides complete solutions for large-area optical image sensors in different focus markets, including smartphones, border security, and smart inventory management. Although Isorg has started off in the OPD sensor market as a manufacturer, the company has also developed all the necessary competence to become a complete solutions provider of self-manufactured hardware (e.g. sensor modules and optics) to the development of readout IC electronics, which are integrated with software for fingerprint matching from Isorg’s software partners. The company’s large-area fingerprint sensor solutions aim to bring security to the next level for end-users in order to tackle the security challenges of today’s digital world.

## Automatic smart inventory management: Real-time stock management

Concerning sensor-based applications for logistics, Isorg has developed an innovative solution for automatic stock management. This complete solution is based on the optical detection of items stored in a shelf thanks to sensors strips, readout electronics and communication with customers’ ERP. In logistics management, small parts (C-Parts with a lot of references) mostly represent a low added value but come at significant supply costs. In order to secure the supply of these crucial small parts, minimising the procurement and optimising intra-logistics processes is the right way to move forward.

Isorg has a strong knowledge in optical sensors development and offers many solutions for managing a large number of sensors at once that are dedicated to stock management. Nevertheless, the customer keeps



Isorg’s clean room facilities

its physical storage and ERP. For instance, the German wholesaler Würth Group has adopted Isorg’s technology for its smart inventory management.

## Biometrics: FBI-compliant sensors

Fingerprint biometrics is used today in a very large number of applications, from security, border control and police to access control and banking, among others. One of the challenges is the usage of multiple fingers to increase the level of security, which requires usage of large-area scanners. In the past these high-cost devices were reserved for sensitive applications such as the security of military sites or police.

The current technologies have limitations for large area scanners. It can be difficult to implement capacitive based scanners for more than one or two fingers, and, on the other hand, conventional optical based solutions can be bulky as they require thick optics and a light path.

Isorg’s unique image sensor technology combines slim and large area optical filters and offers the possibility to develop robust, light, large-area four-finger modules for biometrics applications compatible with FBI requirements (PIV or Appendix F).

## FOD (fingerprint on display)

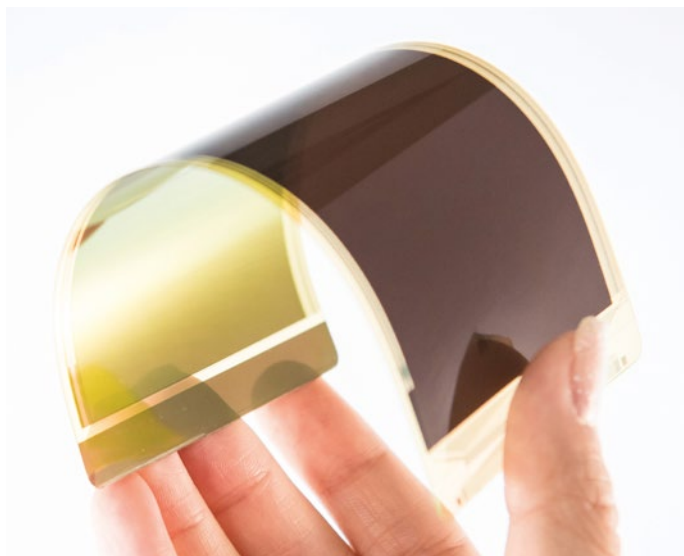
Traditional fingerprint sensors in smartphones are based on capacitive silicon or camera solutions behind the display. A novel solution based on ultrasound was recently launched by a leading manufacturer. But all current solutions only provide a small sensing area around 1cm x 1cm and cannot provide cost-effective solutions for half or full displays. Consequently, these solutions can only allow fingerprint identification for one finger, which means that the level of security is not the highest.

Isorg with its profound knowledge in OPD technology and innovative designs for slim optical filters provides a breakthrough by increasing the security level to support large-area sensors up to full smartphone displays and allows multiple finger authentications that deliver more fingerprint data per user ID. This extensively addresses the demand for high-security activities including access to personal health records, banking transactions, etc.

## Production-ready

Headquartered in Grenoble, France, the company has a fully ready mass production plant in Limoges, France. Its fully printed devices are manufactured at ambient temperature and in

an ambient air environment, allowing sheet-to-sheet manufacturing of 650mm x 780mm plastic foils. The huge 20 000m<sup>2</sup> land area including 3000m<sup>2</sup> of offices and cleanrooms (class 10 000) supports daily operation activities to ensure a smooth flow of the supply chain. With a wide spectrum of solutions addressing different market needs, Isorg presents itself as a comprehensive partner to work with in solving technical needs and levelling up customers' security. Customisation has become a big factor for customers who seek more tailor-made features to suit their needs. Isorg's production line is designed for mass production and the company brings all necessary skills for adaptive manufacturing.



**A flexible sensor from Isorg**

### **CMOS: another application area**

While Isorg started out its history with elementary organic photodiodes, the company moved forward by shaping OPD layers at the top of TFT backplanes, as described earlier. Soon after, Isorg explored the compatibility of its technology with other substrates. Of course, CMOS wafers appeared as a very promising segment. Using state-of-the-art organic materials providing high performances in different wavelengths, the manufacturer rapidly managed to stack its functional ink formulations at the top of CMOS imagers that permit reaching hybrid camera features, also called RGB-Z imagers, including both visible and NIR (near infrared) variants for TOF (time of flight) applications. In addition to the already targeted smartphone markets, this technology opens up other domains such as face recognition in smartphones, but also very strategic markets like automotive and autonomous vehicles by providing longer wavelength performances. With key technological advantages compared to traditional existing technologies the Isorg team is looking forward to entering such promising markets.

Early next year, Isorg will exhibit at CES, the largest technology show in the world. "We want to guide you on a unique and exclusive experience with our live demo of how Isorg breaks through the limitations of current technologies for multi-finger sensors on displays," announces Jean-Yves Gomez.

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*Image sources: Isorg*