

SolarEdge e-Mobility transforms production processes with FasThink

SolarEdge e-Mobility, a supplier of power electronics, batteries, and electric traction systems for automotive OEMs, offers integrated electric mobility solutions for electric and hybrid vehicles. Their production facility in Umbertide (PG) houses an R&D team comprising over 60 engineers and technicians. They also maintain a presence in Terni, focused on Telematics, and in Germany, centered on e-Propulsion.

Their technical knowhow, coupled with agile development and rapid prototyping capabilities, enable SolarEdge e-Mobility to produce complex products in record time.

Their portfolio includes electric propulsion systems, electric motors, transmissions, battery packs, battery management systems (BMS), chargers, vehicle control units (VCU), and specialized software for electric vehicles. Elisa Rossi, the Head of Finance at SolarEdge e-Mobility, highlights the company's drive for innovation, saying, „SolarEdge e-Mobility's electrical systems and components stand out for their high power density and efficiency. To transition from prototypes to large-scale production, we need precision and rapid execution. This prompted our decision to overhaul our production processes.“





The application at work

The application was developed for the SolarEdge e-Mobility production plant in Umbertide. FasThink introduced a smart and flexible solution that's easy to install. It can be quickly and simply reconfigured whenever there's a need for a layout change, either within the production area or inside the warehouse. FasThink integrated its proprietary wireless technologies, including the e-Kanban smart sensor (and its Push2Call variant) and the Pick2Light system, installing them in the shopfloor and warehouse environments. This was done to optimize supply with a lean approach to the production lines.

Understanding the needs of SolarEdge e-Mobility

To cater to the demands of their clientele, SolarEdge e-Mobility recognized the need to streamline warehouse operations, ensure punctual and accurate delivery to production lines, and minimize human errors. They also sought to digitize picking and dropping operations to provide real-time oversight of material flow. Elena Del Signore, the Logistics & Material Director of SolarEdge e-Mobility, elaborates, *"We aimed to enhance and monitor warehouse operations in real-time, make necessary adjustments, and use a system that's both flexible and user-friendly. FasThink's solutions fit the bill perfectly, offering the advantage of customization for future enhancements."*

Thanks to the adaptability of the solutions provided by FasThink, they were able to implement an application that met these requirements and could interact and exchange information with the SolarEdge e-Mobility management system.

The wireless e-Kanban smart sensor manages real-time data, communicating automatically with the management system via an RF transceiver using LoRaWAN technology. This sensor was installed in the assembly area, near the mechanical conveyors on the shelves holding KLT containers, which are standardized containers often used in the automotive industry for small-sized components. Adhering to the full-empty logic: when a KLT container is emptied, the e-Kanban detects the change in status and automatically sends a replenishment request to the warehouse. Push2Call is a wireless system designed to enhance communication and integration between digital and IT systems. It aids in the management of large components, which are typically stored on racks and cantilevers, and also streamlines the retrieval of finished products. By doing so, it ensures that component availability is coordinated in a manner that conservatively uses the limited space available on production lines. On the other hand, Pick2Light, an innovative material retrieval system





using light signals, has been installed on the warehouse shelves. This system aims to make the picking activity more dynamic and efficient, drastically reducing the chances of human error. When the e-Kanban sensors in the assembly area trigger a replenishment request, displays within the warehouse provide information on the type, location, and quantity of material to be retrieved for restocking.

Enhancing the FasThink application with autonomous robotics

The solution devised by FasThink took into account not only the phase of material retrieval and stock management but also the movement between the warehouse and the production areas. As an OMRON Solution Partner, FasThink successfully integrated the AMR (Autonomous Mobile Robot) into the framework designed for SolarEdge e-Mobility, yielding significant performance benefits. The AMR was coordinated with the digital flows, and it was primarily tasked with the transportation of KLT containers from the storage zone to the shelving systems fitted with e-Kanban. This implementation, besides further streamlining the previously manual handling, optimized the efficiency of the staff. Specifically, the warehouse operator, under the guidance of the Pick2Light system, retrieves items and then entrusts the KLTs to the AMR. The robot, in turn, autonomously transports them and delivers to the assembly area, where another operator is responsible for stock replenishment.

The autonomous navigation capabilities of the OMRON LD-60 mobile robot allow it to seamlessly navigate through

the storage area of finished products, which are ready for dispatch. This is a zone frequented by employees and where trolleys move and maneuver large boxes and containers. Marco Mina, the OMRON Business Developer for Robotics, points out, *"FasThink's applications are centered on logistics and intralogistics, facilitating a high-level integration within the realm of cutting-edge technologies. By integrating the OMRON AMR, combined with technologies such as Pick2Light, e-Kanban, and Push2Call, SolarEdge e-Mobility was empowered to tap into the full potential of logistic automation, benefiting from the precise insights into their production processes."*

The harmonization of systems as added value

SolarEdge e-Mobility benefited from the added value derived from harmonizing the four solutions. The e-Kanban, Pick2Light, and Push2Call, synergistically linked with the OMRON AMR, allowed a seamless synchronization of picking and feeding operations, resulting in significant improvements in speed, efficiency, and accuracy.

Furthermore, the capability to monitor warehouse performance in real-time is ensured by a dedicated web-app customized by FasThink based on SolarEdge e-Mobility's requirements. This application allows various devices, such as handhelds, tablets, and monitors, to display the status of picking and line-feeding tasks. This facilitates timely corrective actions when needed. Additionally, with various indicator parameters, the app also supports the generation of reports and statistics at predetermined intervals to consistently monitor warehouse efficiency.

"The application developed in collaboration with SolarEdge e-Mobility is just one of many examples illustrating how it's possible to tailor-make a stock management system, warehouse and production flow starting from established application platforms. FasThink's mission is to redesign last-mile production processes through the integration of IT systems and OT technologies, specifically technologies like Pick2Light, e-Kanban, Push2Call, and the Connect Orchestrator platform. Delivering a solution like this, which integrates with existing management systems, represents a significant step toward the digitalization of industrial flows and using data for strategic operation planning," concludes Marco Marella, General Manager of FasThink.

Results

The solution provided by FasThink was easy to install and use, and it successfully met all the set objectives. Specifically, it eliminated supply errors and production downtimes caused by the absence of various materials. It also led to an increase in stock accuracy and optimized the performance of the warehouse team, resulting in a notable improvement in direct labor efficiency. Collaborating with FasThink highlighted values such as reliability, responsiveness, and precision. All these enhancements translated into a significant added value to the services and products of SolarEdge e-Mobility for the end-users.

About FasThink

FasThink is a modern company that has rapidly established itself in the providing of consultancy and technological support to the middle and large-scale industries in their path towards Digital Transformation. FasThink means designing, manufacturing and marketing of proprietary and licensed systems and components for identification, traceability, data collection and factory automation in the high range of the market.

FasThink designs and produces software solutions that redesign the manufacturing processes in the so called "last mile", integrating OT technologies with IT systems in use. FasThink specialises in the integration of solutions with RFID, Pick To Light, e-Kanban sensor, Mobile robot, Blockchain and Localization technologies as well as components and IoT sensors. FasThink relies on partners of excellence who share a tireless path of innovation technology with a view to Industry 4.0.

FasThink solutions are used by middle and large-scale Industries in the Manufacturing and Logistics sectors, in the Automotive, Food, Retail and Pharmaceutical markets. For more information, please visit: <https://www.fasthink.com/>

About Solaredge

SolarEdge e-Mobility is a supplier of power electronics, batteries, and electric traction systems for automotive OEMs with years of experience and expertise in developing integrated electric mobility solutions for electric and hybrid vehicles. SolarEdge e-Mobility production facility in Umbertide (PG) houses an R&D team comprising over 60 engineers and technicians. They also maintain a presence in Terni, focused on Telematics, and in Germany, centered on e-Propulsion.

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SolarEdge e-Mobility's aim is to achieve emission-free driving. For more information, please visit: <https://e-mobility.solaredge.com/>.

About OMRON Corporation

OMRON Corporation is a global leader in the field of automation based on its core technology of 'Sensing & Control + Think'.

OMRON's business fields cover a broad spectrum, ranging from industrial automation and electronic components to automotive electronic components, social infrastructure systems, healthcare, and environmental solutions. Established in 1933, OMRON has over 29,000 employees worldwide, working to provide products and services in 120 countries and regions. In the field of industrial automation, OMRON supports manufacturing innovation by providing advanced automation technologies and products, as well as through extensive customer support, in order to help create a better society. For more information, visit OMRON's website at: industrial.omron.eu