

NEXT STEPS INTO SAFETY-AUTOMATION-FUTURE

INTERVIEW WITH CHRISTIAN HELLER

The automation industry has to provide solutions for a variety of challenges. Sustainability, energy efficiency and resource conservation are just some of them. How does a traditional company in the field of safety automation deal with these issues? What is being offered to customers in this regard and how is the product range being adapted? Christian Heller, Head of Product Management & Customer Service Technology at the Schmersal Group, provides answers to these questions and more.



Fig. 1: Christian Heller, Head of Product Management & Technical Customer Service at the Schmersal Group

Mr. Heller, Schmersal can reflect on more than 75 years of history and many years of experience in the safety of machinery. In your view, which top three trends are currently having the greatest impact on the market for automation and safety technology?

Christian Heller: We believe that the top three trends are digitalisation, IO-Link safety and servitisation. Digitalisation is primarily about networking, connectivity, data generation and evaluation. These are functionalities that we integrate into our products and subject to constant ongoing development. The digital transformation requires our components to have end-to-end communication capability, even in devices with lesser complexity. Another aspect of digitalisation is security,

something we're going to have to devote permanent attention to in the future.

IO-Link is a globally standardised IOI technology that has been established in automation technology for more than fifteen years, something that is confirmed by the steadily growing number of nodes. With IO-Link, a wide range of automation technology sensors and actuators can communicate with all common fieldbuses via an IO-Link master. The introduction of IO-Link Safety means that there is also a standard in safety technology for the very first time. Users benefit from the same connectivity, simple parameter setting and the opportunity to have enhanced diagnosis data.

Servitisation, not a very pretty term, but still relevant to Schmersal in view of the range expansion we have been working on for several years. It includes a combination of components and systems, i.e. hardware, and services. This is important because the safety of machinery is a complex area, and not necessarily one of our customers' core strengths. In future, we want to increasingly offer our customers the option to outsource the safety of machinery in its entirety. This would mean Schmersal being responsible for the safety of its customers' machinery 24/7 – Safety as a Service.

Climate change and the scarcity of resources are amongst current pressing issues. From Schmersal's perspective, what significance do automation and safety technology have to counteract both?

Christian Heller: With digitalisation and tools like IIoT-based platforms, we're getting more transparency when it comes to production information, making it much easier to optimise processes. As an example, these methods can be used to analyse and reduce

energy consumption in production, and that has a positive impact on the CO₂ emissions of production plants. In addition to their actual safety function (e.g. safe shutdown), most safety technology devices can also provide a wealth of additional information. We are already bringing safety and measurement technology together. The benefit for customers is that they not only receive a safety device, but data that enable process improvements as well.

You say that you supply products and systems for the safe, efficient and sustainable design of machinery and systems. Can you explain what this means in a little more detail?

Christian Heller: As ever before, the key feature of our products is that they contribute to the safety and safe operation of machinery. In addition, it's important that safety technology does not lead to a loss of productivity – on the contrary, it needs to support production processes and contribute to the system's high efficiency, availability and productivity. By sustainable design, we mean that we develop our products with the goal of minimising the harm to the environment during production, use and recycling or disposal at the end of the product's lifecycle.

As an example, our safety switchgear and safety controls consume only a small amount of electrical energy in operation, but we continue to focus on improving energy efficiency in new developments.



Fig. 2: The Schmersal Cloud Solution also offers apps for energy monitoring, among other things.

In May, you announced your intention to use recycled material for safety switchgear with plastic enclosures in future. How close is this to series implementation?

Christian Heller: Our aim is to use twenty per cent recycled regranulate in the switches we produce by injection moulding. Initial independent analyses now show that Schmersal is well on the way to achieving this goal. To ensure that the recycled material we use has no impact on the quality of the safety functions, Schmersal commissioned comparative tests by the Lüdenschied Plastics Institute. The tests looked at switches made from purely virgin material when compared to switches consisting of 80 per cent virgin material and 20 per cent regranulate. Three different plastic materials were tested: Ultramid, Hostaform and Frianyl.

The results from the Lüdenschied Plastics Institute are now available: regranulates made from Ultramid and Hostaform could be used immediately; further product tests are required for Frianyl.

We have also found a solution for subsequent UL certification. According to the UL organisation, a regranulate content of 25 per cent is achievable in safety switches and the switches will be approved if the regranulate is processed in-house. We are now planning to purchase a centralised treatment system to facilitate this. The next step is certification of the safety switches by the TÜV, which would clear the way for series production of switches containing regranulate content.

This would make Schmersal the first manufacturer to use recycled material in the production of safety switches.

This project was given as part of your sustainability strategy designed to reduce your carbon footprint. Can you provide further insight into this strategy?

Christian Heller: We are making a number of changes to help us reduce our carbon footprint, from the use of renewable sources of energy to reforestation of areas in places like Brazil and recycling of production residues. When we develop new products, we keep a close eye on their lifecycle balance in terms of CO₂ emissions and consumption of resources. Generating energy in a way that is as carbon-neutral as possible is essential when it comes to meeting climate targets and reducing CO₂ emissions. We rely on renewable sources of energy at our production sites to help us gradually reduce our CO₂ emissions, like photovoltaic systems at all four German sites, as well as energy-saving energy generation, like with our combined heat and power plant with cogeneration at our Wuppertal site.

Your Schmersal Cloud Solution is a way to increase the efficiency of machinery and systems. What services do you bundle in this offer and what are the benefits for customers?

Schmersal's IIoT concept essentially offers four solution approaches: energy management, calculation of key performance indicators (KPIs), such as overall equipment effectiveness (OEE), condition monitoring and predictive maintenance. Continuous monitoring of machinery and systems allows you to capture information about their current status so that you can identify potential problems and failures early on.

Forecast models can then be developed using that data so that you can carry out predictive maintenance based on the actual condition of the system components. This helps to minimise downtimes and reduce maintenance costs.

You have said that you want to start offering apps for energy monitoring as part of your cloud solution. Can you give us some brief insight into the use, availability and benefits of the apps?

Christian Heller: Schmersal's 'Energy Monitoring Solution 4.0' (EMS 4.0) is a modular solution that makes energy consumption in production transparent and provides a comprehensive database for analysis and optimisation. With its front-end configuration, the solution makes it easy to set up and assign energy meters. The dashboard visualises the consumption of all systems and their development. A range of evaluation functions allows for the generation of detailed reports on energy consumption, including to individually defined parameters.

Limit values can be also defined and an (alarm) message sent to the user if these values are exceeded. This gives users a solid basis for avoiding peak loads and the additional costs that come with that, and for efficiently utilising all available energy resources according to the time of day. They can test and evaluate the efficacy of individual measures and prepare the data for an energy management system in accordance with ISO for CSR reporting, something that is already compulsory for larger companies across the EU. And because calculating KPIs is also part of our IIoT concept, energy efficiency can be incorporated directly into the calculation of the OEE.

In addition to products and systems for the safety of machinery, you also offer training and services through your tec.nicum division. Back in spring, you announced the restructuring of the division, including the founding of tec.nicum – Solutions & Services GmbH. What was the background to this and how will the customer benefit?

Christian Heller: The goal of the restructuring and the founding of tec.nicum – Solutions & Services GmbH is to establish a globally integrated tec.nicum team to coordinate the global activities of the Schmersal Group's services division. We want to be able offer a comprehensive global service portfolio. In addition, we also want to support our customers with the transformation through digitalisation and Industry 4.0 with new technologies and adapted services.

Which is why we have added a further two modules to the existing four tec.nicum modules: digitalisation and outsourcing. The digitalisation module covers digital solutions that not only concern safety technology but that support customers in implementing their Industry 4.0 concepts and achieving their sustainability goals as well. For outsourcing, we offer complete solutions – from preassembled system parts to integrated safety solutions in which the entire value-added chain is analysed.



Fig. 3: In the future, recycled material is to be used in the production of safety switchgear with plastic enclosures.



Fig. 4: The range of safety services offered by tec.nicum is being significantly expanded – particularly with regard to digitalisation and complete solutions for machine safety.

Schmersal has been declared the ‘Best Managed Company’ for the second time this year. What sort of motivation does this award give you?

Christian Heller: The ‘Best Managed Company’ competition offers us a professional view from the outside and an external evaluation of our processes. The award confirms the work that we do, which is something we’re of course very pleased about. That’s mostly because, in addition to strategy, productivity and innovation are also an important evaluation category. But receiving the award doesn’t mean that we can just sit back and relax. We need to continue to work on new developments and improvements.

Finally, please give us a glimpse of what’s next – what highlights and innovations can interested parties look forward to at this year’s SPS and future trade fairs?

Christian Heller: As an active member of the IO-Link Safety working group, Schmersal has devoted quite some time to ensuring that the benefits of the standardised IO-Link communication system can be utilised for functional safety as well. At SPS 2024, we will showcase an IO-Link Safety installation system for the first time. The system integrates solenoid interlocks and safety sensors from Schmersal, as well as failsafe actuators. Another innovation that we are set to showcase at SPS is a simulator that uses a digital twin to simulate the function and behaviour of a door safety system. We want to use virtual mapping of safety systems to support our customers in simplifying the installation and commissioning of new machinery. We will also use SPS as an opportunity to present our expanded tec.nicum portfolio.

Technical article, published in:
open automation, 5/2024
www.openautomation.de
Publishing house: VDE Verlag

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