

Technical article, published in:  
automation 3 | 2015, Verlag Henrich Publikationen

## »HRC is an exciting subject«

### DR ANDREAS HUNSCHER

The doctor in electrical engineering is in charge of the Schmersal factory in Wetztenberg as well as the global system and solutions business of the Wuppertal-based family company, and particularly appreciates the culture, structure, and future-orientation and real dynamism „in an extremely multi-faceted and exciting market“. The Schmersal Group turned over around 210 million euros in personal and mechanical safety during the last financial year.

### Dr Hunscher, how automated is the Wetztenberg factory?

In our production, the working stages which are automated are primarily those which require high output and quality, such as loading, welding and testing the circuit boards and the fully assembled products. There is also plenty of manual work, especially in assembly and packing. This is not uncommon in electronics production, but it is expensive. This is one of the reasons why other companies are relocating their production or part of it abroad.

### But Schmersal is doing that too.

We are not producing in Brazil, China and India mainly for cost reasons, but in order to provide a faster service to our customers in North and South America, East Asia and India. More than that: In these branches, we develop and modify safety products so that they meet the exact specific requirements of the customers in these markets. We develop and produce safety solutions for the European markets from Germany, i.e. at our factories in Wuppertal, Wetztenberg, Bergisch Gladbach and Mühldorf am Inn. We could not be more in line with the motto „Think global, act local“.

### What are the national and international market volumes for safety technology?

It is difficult to put a figure on it because the definitions and assignments can vary. An analysis carried out by the Federal Association for the Safety Industry two years ago gives the market volume for safety technology at more than twelve billion euros in Germany alone. This includes all safety technologies and services. And there is also no distinction between industrial and private users. This analysis suggests that electronic safety technology, where Schmersal is most at home with its safety switchgear, solenoid interlocks, sensors, light barriers and grids, relays, controls, alarm and messaging equipment with safety functions, etc., is worth four billion euros. If we deduct the shares for video surveillance, fire, attack and break-in protection, there is around one point five billion euros left.

### What is the competition like for Schmersal?

There are lots of competitors, including at an international level, but the market for safety technology is clearly dominated by German companies.

Many of our fellow market players are in the process of moving from being component suppliers to system and solution providers, which means they want to be where Schmersal is already.

### Is that what sets your company apart from the competition?

Yes, it is that on one hand, while on the other hand we differentiate ourselves on the basis of our module, scalable range of more than twenty five thousand products for the safety of people and machines. It provides us with

the foundations for acting as a systems and solution provider in the market. Some of our fellow market players have now recognised the benefits of this and are now stocking up on the product side.

### This product range conceals a specific development strategy. What can you tell us about that?

For us, all of our new developments and advances are sourced from our wide-ranging product management and sales departments. These employees observe the markets very carefully, analysing trends, requirements and technical developments. They are also in close contact with the customers. This results in a whole range of ideas which have a major impact on our product strategy. The product management team defines how we hope to develop in the



„While it is very easy to control the axles and movements of a robot, systems to monitor the movements of a human within the working area in real time are not yet technically sophisticated enough.“

Dr Andreas Hunscher, Schmersal

various product segments and what our objectives are in a „roadmap“. This is constantly updated and is clearly oriented towards the philosophy we follow and towards the valid safety standards. The roadmap is also a ‚to-do list‘ for our developers and design engineers. There are no guidelines which suggest we need to launch a specific number of new products onto the market every year, or similar.

#### **How many employees are there in the design and development department here in Wetzlar?**

Of the one hundred and fifty employees working here, around twenty are in the design and development department. There are a good one hundred developers and design engineers working for the Schmersal Group around the world.

#### **How closely does Schmersal work with its customers when it comes to new developments and advances and what examples can you give?**

Cooperation with our customers is a very important factor. For example, responses to customer surveys are collated into technical specifications which are then used to produce new end products which we can then have tested by various leading customers at a very early stage of development. Their views and test results are verified by us to ensure the end result is a series product which is ready for the market and universally applicable, but can be modified on a customer-specific basis if required.

We also offer purely customer-specific developments. For example, we have been working together with leading robot manufacturers to produce safety and switchgear systems for the separate monitoring of robots to communicate with robot controllers. The clever bit: It not only monitors the axles of the robots but also their positions within a three-dimensional space. This enables us to produce a protected, virtual, Cartesian working area which is very important, for example, for safe collaboration between people and robots. We are currently discussing with the various robot manufacturers what features the next generation of this safety controller could or should have.

#### **What do you think about human/robot collaboration?**

HRC is an exciting subject which goes well beyond industrial applications. Some robot manufacturers have already presented their first collaborative robots, while other development projects are still in the pipeline. There is a lot of work currently going on in the standardisation of risk analysis to determine the conditions under which humans and robots can work together safely and without barriers.

#### **But there is no shortage of safety experts who are critical of the idea of human/robot collaboration without a safety fence, or even reject it outright.**

Personally, I find these fixed negative attitudes outdated and would instead suggest we analyse the pros and cons of the subject, bearing application-oriented considerations in mind. And companies in the safety technology sector need to start thinking about the technical possibilities in order to implement human/robot collaboration safely and put these solutions into practice. But if we look beyond the criticism on the one hand and the euphoria on the other, and they are both present in equal measures, it will quickly become evident in practice where collaboration between humans and robots makes sense and where it does not. After all, there will be lots of robot applications in the future which are processed unmanned in high-security working areas.

#### **What are the safety critical aspects of human/robot collaboration?**

There are a few. But there is one major aspect: while it is very easy to control the axles and movements of a robot, systems to monitor the movements of a human within the working area in real time are not yet technically sophisticated enough.

#### **Do you see a general trend to shift safety functions more and more towards robot and plant controllers or software solutions - and what will this mean?**

Yes, there is no question that the trend exists, triggered by the hype over Industry 4.0 with a flat automation pyramid and machinery and devices networked via the internet which can supposedly optimise themselves. We cannot yet work out how

this trend will pan out, as the main question is: where does it make sense? If the safety functions are integrated one-to-one into an automation controller, then the whole system needs to be recertified every time a change is made, whether it is a control command or a functional element, and that costs the operator of this automation solution lots of time and money. The alternative would be a modular system whereby only the relevant communication or functional module would need to be recertified in the event of a change. The advantage of this is the fact that the pace of change is faster in the automation sector than in the safety sector.

#### **At Schmersal, are you working on a modular control system like this to take over automation and safety functions?**

Yes, because a control system of this kind has not only the benefits mentioned earlier, but is also cheaper to run and simpler to wire, and does not require a separate control cabinet for the safety controller. Irrespective of this, traditional safety controllers will remain just as important.

#### **The safety control system Protect PSC1, which Schmersal presented at last year's SPS IPC Drives, is also modular in design. How is this system different from its predecessor or from competitor products and what are the benefits for its users?**

The compact Protect PSC1 is an addition to our range of safety controller systems in the mid to high-end range and will replace our large-format controller system Protector PSC. The Protect PSC 1 is aimed at machine and plant constructors, for example in the automotive and packaging industry and the food industry. Currently, the PSC 1 incorporates two freely programmable controllers, plus central and decentralised I/O expansion modules for secure signal processing for electronic and mechatronic safety modules such as safety door switches, light grids and the like. The system is scalable in order to meet the needs of machine and plant manufacturers and operators with respect to modularity, expandability and machine concatenation.

Another real strength of this controller system is its real-time communication with the fieldbus level, the local level and the sensor level, in this case via a Schmersal SD bus.

This makes, for example, diagnostics easier and saves on wiring. The PSC 1 communicates with all standard fieldbus systems. All you need to do is use the software communication interface to select and configure the relevant protocol. Cross-communication between up to four PSC 1 controllers is also guaranteed. It is the first of its kind on the market. Another real benefit is the safe movement monitoring for between two and twelve axes.

The „SafePLC2“ programming software with its object-oriented development environment and comprehensive function libraries is also new and no less interesting for users, as its individual pre-produced blocks can easily be linked into complex applications via drag and drop; for example, for press applications or similar. Last but not least, I would like to mention the „SafePMT“ configuration software, which allows the parameters defined in the programming software mentioned above for safe axle monitoring to be quickly and easily amended or adjusted without necessitating repeat validation.

**What do the lead customers you mentioned earlier think about the Protect PSC1 system?**

Honestly? They love it.

**The first variants of the PSC1 system will go into series production no earlier than the second quarter. Are the first projects already in the pipeline?**

Yes, they are. For example, one of our lead customers in the automotive supplier industry wants to integrate these control systems into its production. Another interested customer is looking into safety for building site lifts. These are just two examples from a whole series of interesting enquiries.

**You mentioned standardisation briefly when we spoke about human/robot collaboration. To what extent is Schmersal involved with standardisation committees and panels?**

This is something Schmersal has been working intensively on for decades and in many cases takes on a leading role. There is also a group of experts in-house, made up of people with practical experience, which aims to support the development of norms, reforms and standardisation at a national and international level. One very recent example: Because there is no Machinery Directive as we know it in Brazil, the government has decided to create a similar catalogue of standards which is adapted to the requirements of machine and plant operators in the region, one of our experts played a major role in driving this project forward.

Dr Andreas Hunscher  
K.A. Schmersal GmbH & Co. KG, Wuppertal

**K. A. Schmersal GmbH & Co. KG**  
Möddinghofe 30  
42279 Wuppertal  
Telefon: +49 202 6474-0  
info@schmersal.com  
www.schmersal.com