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SAFETY FIRST
OPERATING AGILE, AUTONOMOUS SYSTEMS SAFELY

Robotics, optics, Artificial Intelligence – these are the three main areas of modernisation in industry, and the specialist area of a fledgling French company. Reliable safety technology is essential to the safe operation of countless flexible, agile and autonomous systems and to their optimal functionality without danger to operators.

Fledgling French company Siléane from St. Etienne develops latest-generation autonomous industrial robots to handle all manner of different products. The robots adapt autonomously and in real time so that they can avoid hazards, while at the same time ensuring consistent speed and production flow on production lines.

'Our range of robots includes three different models – the Flowpick for rapid and adaptive pick-and-place operations, the Rovaldy for surface handling applications and the Kamido bin-picking and sorting robot,' explains Jérémy Gagliardini, Team Leader for Automation and Robotics in Siléane's TTS business division, which has responsibility for surface handling and microtechnology. The company's target groups are production operations, as well as research and development departments for special projects: 'We can also undertake research if asked to do so, and supply our R&D expertise.'

Fig. 1: The modular structure of Schmersal's PSC1 safety controller helps to simplify the construction of complex, multi-part systems with networked safety subsystems

MODULAR SAFETY CONTROLLER

The Protect PSC 1 modular safety controller offers safe logic control as well as a connection for all standard safety switchgear devices to SIL 3 or PL e. As the Protect PSC product series can be designed modularly, either centralised or decentralised, the controllers can be precisely adapted to the task in question.

Safety as the principal issue in development

Development is about more than just performance, operating times and reliability, but about reproducibility and the sensitivity of human movements as well. 'As we equip some very large machines of up to 10 x 10 metres in size, it's important that we have efficient systems in place to ensure maximum safety for operators and maintenance technicians who might be in or close to the machine,' explains Jérémy Gagliardini.

Siléane turned to Schmersal's expertise for help safeguarding affected areas during a machine standstill, maintenance work or tool change and to help enable safe access to hazardous areas.

The solution came in the form of solenoid interlocks with integrated RFID sensor systems. 'For our cabling requirements, we use a passive fieldbox from Schmersal, which connects several AZM300 series solenoid interlocks in series. From the fieldbox is a cable to the Schmersal Protect PSC1 safety controller. This allows each individual solenoid interlock in the circuit to be locked and released,' explains Jérémy Gagliardini. The hazard is primarily from robots and systems working at high production speeds. Solenoid interlocks help to ensure that operators are protected from hazardous movements.

From machine safety to industry 4.0

The passive fieldbox (PFB) not only allows for cost-effective wiring of safety switchgear devices in series, but also forwards the diagnostic data and status information to the machine operator's operating terminal. 'This level of transparency means that users are always informed of machine operating states and can carry out maintenance measures with much greater efficiency, as the system can quickly detect errors,' explains Jérémy Gagliardini. This is not the only benefit of this kind of system: 'The PFB means that there's a much lower wiring effort. A solenoid interlock usually means laying eight different cables.

With the PFB, we only need one cable between the solenoid interlock and the distributor, which also helps to prevent voltage drops, which can be a problem considering the length of the machine.' The PFB is also beneficial for machine operators, as the fieldbox enables individual diagnosis of the connected safety switchgear devices. This means that an operator can easily tell which switch in the series has triggered a signal. As such, if there's a problem, he only needs to replace the faulty component identified, and does not have to lose valuable time troubleshooting.

Fig. 2: Siléane uses AZM300 series solenoid interlocks to safeguard hazardous areas

Fig. 3: The status data for connected devices are transmitted via the SD-bus as a universal communication interface

Safety Controller helps to simplify the construction of complex systems

The modular structure of Schmersal's PSC1 safety controller helps to simplify the construction of complex, multi-part systems with networked safety subsystems. 'In our planning, we set out which areas need to be secured, all the way through to multi-zone management, depending on the risk assessment. The individual areas can function completely autonomously.' The benefit: By using Schmersal's PSC1 compact controller, Siléane can have one machine running while another is being serviced on production lines fitted out with two machines.

'Siléane is a forerunner in Industry 4.0, particularly in the capture and harmonisation of sensor data,' explains Jean Baptiste Fournaise, Managing Director of the Schmersal subsidiary in France. 'This way, the company can capture all manner of valuable information about the status and service life of the equipment, and with it can carry out predictive maintenance. Additionally, Siléane also carries out remote maintenance for some customers to help ensure the fastest possible intervention.' This information is supplied by another Schmersal solution – the SD-bus as a universal communication interface. With it, status data for equipment are always available.

Fig. 4: The passive fieldbox (PFB) enables cost-effective wiring of safety switchgear devices in series

TRANSPARENCY AND SAFETY AS STANDARD

'The passive fieldbox not only allows for cost-effective wiring of safety switchgear devices in series, but also forwards the diagnostic data and status information to the machine operator's operating terminal. With this level of transparency, users have a constant stream of information about the operating states of their machines.'

Jérémy Gagliardini, Team Leader for Automation and Robotics in Siléane's TTS division

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