

MENSCH und AUTOMATION

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PILZ

THE SPIRIT OF SAFETY

Communicating knowledge is fundamental

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Head of Machines Department,
TÜV NORD CERT GmbH.

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In an extensive plant for the
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The panorama on the mountain top
of the Stanserhorn provided the perfect
setting for the 20th anniversary
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This is how it works

One challenge that we are encountering in the field of mechanical engineering is how to resolve the conflict between safety, productivity and ergonomics of machines and systems. If we do not succeed in resolving this conflict, the result is often the manipulation of safety equipment.

It is human nature to try to interfere in a process if this process is not proceeding so as to meet human requirements in an optimum fashion. Machine operators may consider barriers at machines detrimental to the success of their work task. The work that, due to the avoidance of the safety measures provided, is less extensive, however, is experienced as a success.

Especially movable guards are frequently the subject of manipulation. They are a means of separation of man and machine in order to provide protection against dangerous move-

ments. The operating personnel must continuously open and close gates, covers or flaps for operating or mounting purposes – this involves effort which the operator seeks to minimise.

“An intelligent safety concept must therefore offer the required degree of safety, sufficient space and creative leeway to the design engineer and, lastly, maximum operator convenience to the user”, Martin Bellingkrodt recapitulates. In his function as product manager, he is responsible for safety sensors at Pilz.

The awareness of danger decreases with the

amount of time over which such manipulated equipment is used. It is proved by various studies that there is a correlation between defeating safeguards and accidents at machines. Approximately 25% of all accidents can be attributed to manipulation. According to a survey by the central federation of industrial professional associations, more than every third protective device is manipulated permanently or temporarily.

Correct dimensioning of safety equipment

If safety equipment is overdimensioned, this has

an unnecessary detrimental impact on the user-friendliness and manipulation has to be expected. The principle of “the more, the better” does not work in the field of safety technology.

Therefore defeating safeguards is a key aspect of EN ISO 14119 “Safety of Machinery – Interlocking devices associated with guards – Principles for design and selection”.

Continued on page 2





Dear Readers,

Sensors are omnipresent. We find them in household appliances, mobile phones, vehicles and many other consumer devices. In the same omnipresent fashion, sensors are used in industrial applications, usually with a more precise response and in more robust designs. There are innumerable applications and technologies.

In the field of safety, sensors play a major role. Gates, safety fences or interlocks can be monitored. In this connection, there is one thing that can be seen time and again: They are often manipulated. Because protection is often detrimental to productivity. Therefore, again and again, the attempt is made to outwit the sensor in industrial safety applications. Supposedly it is much easier and also much more efficient to work on a machine if the "tedious monitoring" function has been bridged - such is the idea behind this.

Thus, sensor manufacturers are requested to block the door to this dilemma of protection versus productivity. Therefore all Pilz sensor products have one common goal: to offer protection to persons, but at the same time not to reduce the productivity of the machine or system.

Because Pilz always focuses on human safety and machinery safety as well as on the plants' productivity. This approach ensures safe, quick and optimum production.

Kind regards,

Marcel Mettler is the managing director of Pilz's Swiss subsidiary based in Mägenwil.

► 360° Continued from page 1

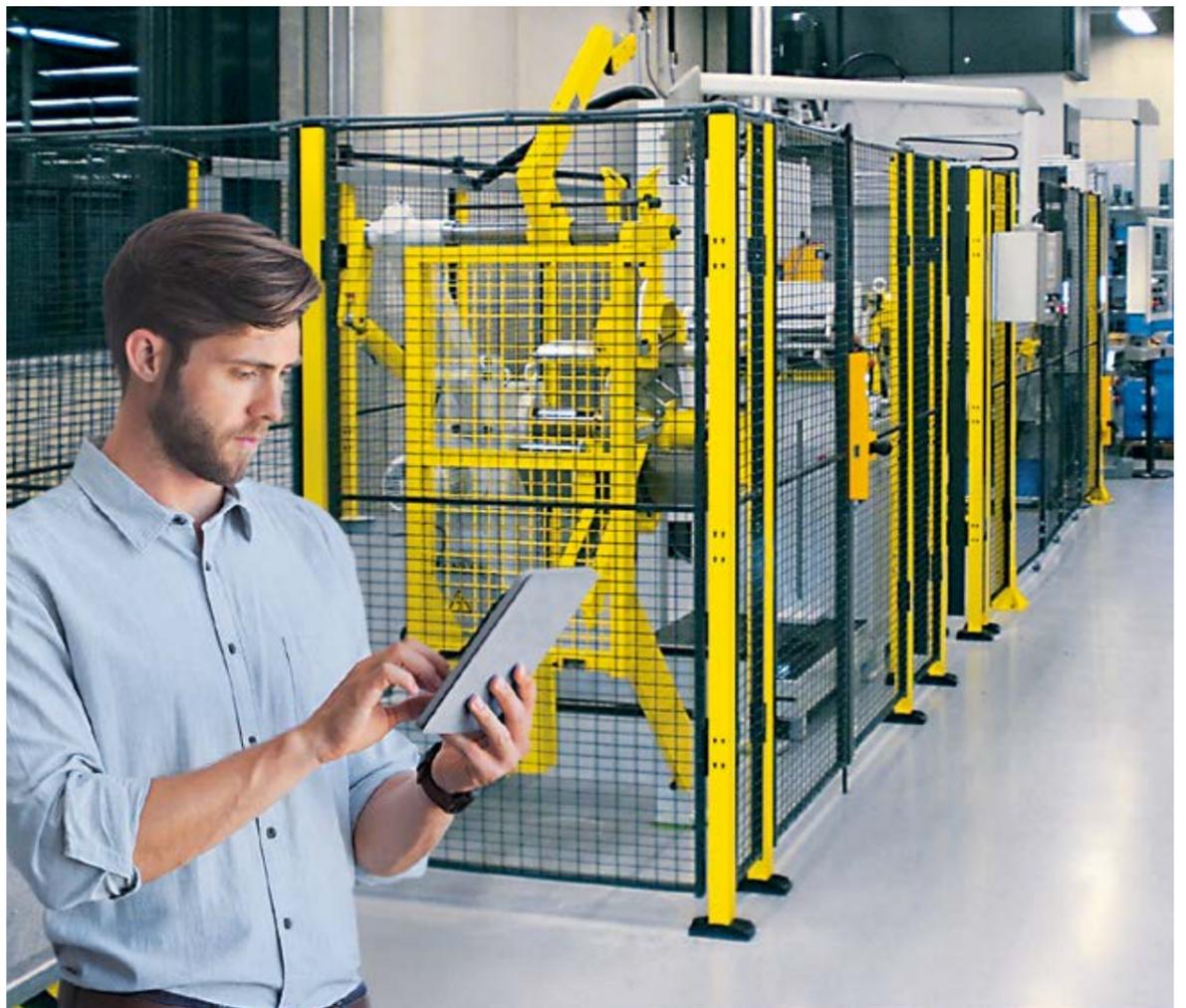
The standard that has been in effect since 2014 defines principles for the design and selection of safety gate systems, providing direct assistance to design engineers. In contrast to the previous standard EN 1088, EN ISO 14119 considers additional technologies such as RFID or electromagnetic guard locking devices, classifies interlocking switches and regulates more clearly the specifications for installing guards.

Avoiding incentives for manipulation

With regard to the subject of manipulation, ISO 14119 requests to check whether there are any "incentives to defeat" the interlocking devices. Designing machines so that the wish to manipulate them does not come to mind at all is top priority. And if potential sources of manipulation cannot be excluded, it is essential that manipulation is made as difficult as possible for the operator.

machine is designed and, for another, the two fields of mechanical engineering and automation collaborate closely. "Interdisciplinary thinking is a key for reconciling plants and machinery that provide safety, ergonomics and productivity", Elsässer says. "Fortunately, this awareness is gaining increasing acceptance among mechanical engineers."

In ongoing operation, the employer is responsible for his employees' safety and health within the scope of his responsibility. He must instruct the employees correspondingly and check at regular intervals whether "his" machines are manipulated. The legal foundation of this is the industrial safety regulation. It often depends on the corporate culture whether these measures are working. The following is a fact: If the subject of manipulation is part of staff dialogues and target agreements, the number of manipulative acts is reduced.



The defeating of safeguards – here detection zones – can be prevented by solutions offering the coordination of safety and productivity. This process is supported by new diagnostics features.

Safety device diagnostics

The "safety device diagnostics" solution (SDD) consists of a fieldbus module plus distributor and safe sensor technology PSEN. The diagnostic solution makes it possible to also retrieve extensive sensor data easily and from a distance. Like this, service calls can be considerably reduced and productivity can be significantly increased. "Safety device diagnostics" data such as subtasks, voltage reductions or increases, temperature effects, number of switching cycles, contact bounces of the door, RFID ID/ID information of the actuator are provided as diagnostic information. All diagnostic data that are additionally provided by each sensor

facilitate both the error localisation and preventive maintenance, in turn reducing downtimes.

Furthermore SDD is able to detect any manipulation carried out – whether by bridging the safety circuit or by using a spare actuator. SDD provides the diagnostic data to the control system and can also trigger signal encoders via local output signals, which are able to indicate the safety status to the operator.

This is a measure to raise the bar against manipulation without limiting the direct availability of the plant.

This can be achieved by, for instance, installing hidden interlocks or by using special screws to mount them.

In the past, interlocking devices that are prone to wear and that are exposed have produced incentives for manipulation, since their reliability is especially limited when they are frequently used. New wear-free products are designed in a more compact fashion such as the coded safety switch PSENcode. This provides machine manufacturers with better installation options.

Race to safety

Technology alone, however, is not enough. "If we only rely on technology, the fight against manipulation is like the race of the tortoise and the hare", Harald Elsässer, coach in the Pilz Academy says. For the past 10 years he has held training courses on the subjects of the machinery directive and standards.

Experience shows, Elsässer says, that incentives for manipulation can be reduced best if, for one thing, the subject of safety is taken into consideration as early as possible when a

In ongoing operation, furthermore new diagnostic options help to not only detect manipulation, but also to increase the plant availability. "Pilz safety device diagnostics provides support to detect errors more quickly and thus makes a significant contribution to reveal temporary and continuous manipulation", Martin Bellingkrodt explains (see box).

Safety that reconciles protection with productivity is created by the interaction of technical and organisational measures. The earlier and closer design engineers and users are working together on a project, the easier manipulation can be prevented. The best solutions are simply found when people communicate with each other.

Webcode:
web5172

Online information
at www.pilz.com

Communicating knowledge is fundamental

The vocational training as certified machinery safety expert, which has been initiated in a joint initiative by TÜV NORD GROUP and Pilz is appreciated worldwide.



▶ **Mr Schiereck, do you consider machinery safety as a necessary evil?**

No, I don't. It is an indisputable fact that everyone who works at a machine wants to go home safe and sound after work. Machinery safety and accident prevention are therefore rightly considered to be elementary requirements with regard to machines. And machinery safety also pays off from an economic point of view, because if there actually is an accident, this may not only be detrimental to health, but usually entails immense damage as regards cost and image.



The training as CMSE® – Certified Machinery Safety Expert is a qualification that is accepted worldwide, offering a sustainable 360° overview of the field of machinery safety.

Not least the collaboration between Pilz and TÜV NORD makes the Certified Machinery Safety Expert training an excellent training offer in the field of machinery safety.

Trainers all have a wealth of experience in this field. All the knowledge you need is conveyed using project examples, so that delegates gain practical understanding alongside the theoretical training.

▶ **A majority of the accidents that occur when people work with machines is caused by manipulation. What are the causes? How can they be avoided?**

There are various causes of manipulation; often time and cost pressure as well as convenience are the triggers for outwitting safety mechanisms. Often, however, it is the ambition of wanting to optimise operational procedures oneself. In this case, unfortunately we are dealing with a poor understanding of safety. This may also be brought on by overdimensioning of the safety function, thus impairing operational procedures although

this would not be necessary at all.

▶ **You brought up the subject of the employees' understanding. How can this be promoted?**

First of all there must be a certain level of know-how serving as a basis: What, for instance, are the elementary risks that you are facing when you work on a machine - such as body parts getting caught or crushed or suffering burns or shearing injuries? When communicating knowledge, however, the following basic distinction must be made: The group of machine operators, ranging from semi-skilled workers to skilled technicians, must be trained directly at the machine. The group of developers and design engineers needs a more profound qualification. Safety starts with design.

In practice, people unfortunately often lack the specific know-how on what they actually have to do. One reason for this is that the subject of safety of machinery often is only touched at the surface in the curricula and during the apprenticeships, although it should actually be an elementary part of the work, in particular in the work of design engineers. Why this is the case, I frankly do not know either. This makes qualification programmes such as CMSE for which Pilz and TÜV NORD have been working together since 2013 even more important.

▶ **What are the central ideas of CMSE?**

The idea of CMSE is the communication of an understanding of safety, to be applied in practice,

The TÜV NORD GROUP is one of the largest technical service providers worldwide and is active in 70 countries with more than 10,000 employees. Where machinery safety is concerned, TÜV NORD CERT as an "appointed body" offers testing and certification according to safety standards in compliance with the Machinery Directive.

on an international basis. Human life deserves to be protected - in Europe as in Asia. Therefore 80 percent of the training contents are identical. CMSE provides specific examples of the fulfilment of safety requirements.

▶ **Which role does TÜV NORD play with regard to the subject of CMSE?**

Being an independent testing and certification body, TÜV NORD is responsible for the technical monitoring of the training contents and the final exam of the participants after having completed the training. At present, the first re-certification processes are to take place, in order to ensure that the participants' know-how remains up to date.

▶ **Where is the CMSE qualification today?**

After three years, we can report over 1,600 CMSE certificates in 30 countries on five continents. This makes the qualification a great success and an international quality brand.

▶ Panorama EN ISO 14119 specifies principles for the design and selection of interlocking devices

Open, safety gate!

EN ISO 14119 "Safety of Machinery – Interlocking devices associated with guards" in addition to the principles for the design and selection also specifies the basic requirements with regard to products. This makes it easier for design engineers to compare the interlocking devices offered on the market to each other, even if products of the same type differ with regard to their design characteristic as well as to their electrical and mechanical properties.

Whether mechanical, magnetic or even via RFID – depending on the application, design engineers are provided with diverse technologies to secure safety gates on plants and machinery. EN ISO 14119 classifies interlocking devices and distinguishes four types of construction, examples of which can be found in the annex: Types 1 and 2 are mechanical interlocking devices – uncoded hinge switches such as PSENhinge by Pilz are an example of Type 1. Safe PSENhinge switches, for instance, are suitable for rotatable and hinged gates and flaps.

Coded mechanical switches, on the other hand, are switches of Type 2. A coded actuator is a specially designed actuating element that belongs to an assigned switch. Mechanical safety switches PSENmech with a Pilz guard locking make sure that the safety gate is interlocked (guard locking) until the hazardous production process is complete. They can also prevent production from being interrupted as a result of unauthorised access.

Type 3, for example, includes inductive sensors, which are used with appropriate metals and are therefore uncoded. The safe proximity switch PSENini detects the approach of metallic objects without the use of contacts. The

inductive sensor supplies the necessary safe signals via positions and end limits and thus ensures a smooth production process.

Interlocking devices of Type 4 include coded magnetic sensors or sensors with RFID technology. Coded safety switches PSENcode by Pilz therefore serve to monitor the position of guards and serve the purpose of position monitoring. In order to make a clear distinction, the standard additionally classifies the interlocking devices into their coding levels – low, medium and high.

For the first time, additional types of switches such as electromagnetic interlocking devices with guard locking are described in the standard. They work in a wear-free fashion as regards both their interlocking and guard locking function. Examples of this are safety gate systems PSENslock by Pilz.

Protective measures against manipulation

For the types of construction described above, the standard specifies the implementation of specific measures regarding the protection against manipulation. For mechanical, uncoded and non-contact interlocking devices with low coding (Types 2 and 4), the standard specifies the use of irremovable fastenings such as



non-removable screws. This also includes mounting the sensor or its barrier or even the screen beyond the operator's reach or in a hidden position. Only for devices with a high coding which for instance use RFID technology, the actuator for the most part may be mounted in any position. However, it must not be possible to easily remove it.

As regards the design, the standard provides clear specifications concerning the use of the respective interlocking devices. The following

generally applies: Highly coded Type 4 actuators give design engineer the greatest room for manoeuvre because manipulation protection required can easily be achieved using RFID technology.

Webcode:
web5192

Online information
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Digital control technology for the rail

On the InnoTrans 2016, the leading trade fair in the rail sector, Pilz showed in which way industrially tried and tested automation technology can be applied on and near the rail: Solutions by Pilz can be used in applications up to the highest safety integrity level SIL 4 and meet the normative requirements in compliance with CENELEC.

The automation system PSS 4000-R meets the specific requirements posed by applications in the rail sector. On the one hand it consists of universally applicable control systems that are robust with regard to electromagnetic faults, extreme temperatures and mechanical stress. On the other hand, PSS 4000-R provides the software platform PAS4000 for the purposes of design, configuration and parameterisation. Various IEC-611331-3 editors reduce the expenditures for project planning, improve diagnostic options and simplify maintenance and repair.

On the route for rail 4.0

The automation system makes it possible to also control branched and complex systems in a concise fashion. For this purpose, the system relies on the distribution of control intelligence in the field and a modular system structure. Like this, Pilz transfers central elements of Industrie 4.0 to the requirements in the rail sector. PSS 4000-R can be used in various applications with different safety integrity levels in the rail sector. This includes control or monitoring functions in the signalling area, for instance for signal monitoring on level crossings, control and



safety technology or signal box connection. Furthermore control functions of rail vehicles and machinery in the field of track building can be implemented. Thanks to virtual reality (VR), the visitors at the trade fair were able to experience the various fields of application and possibilities: VR glasses showed the details of a railway

application to the visitors, within which they could move and were able to explore it.

“Industry Corner” for new applications

In an “Industry Corner”, Pilz showed further industrially tried and tested products and systems by means of which safety-relevant applications in

the rail sector can be solved. The products exhibited included locking devices for safety gates and a textile with sensory skills which can be used in the areas of gates for the purpose of passenger protection.

Webcode:
web8790

Online information
at www.pilz.com

Safety in the wind industry

It is the task of wind turbines to convert the force of nature in the form of air circulation into usable energy. The challenge is to obtain maximum profit from wind power and at the same time operate the plants safely and efficiently. Speed monitoring plays a key role in this process.

In the case of wind turbines that are equipped with a gearbox, the kinetic energy of the wind is transmitted to the rapidly rotating generator shaft via the slowly rotating rotor shaft and gearbox. The speed-relevant safety functions in a wind turbine include the monitoring of shearpin breakage, rotor and generator speed. According to the Germanischer Lloyd (GL) regulations for the certification of wind turbines, the protection against excess rotor speed represents a safety-relevant function in compliance with PL d. Pilz offers a complete range of products for monitoring and controlling plant states at any time and to meet safety-related specifications.

All motions under control

The speed monitor PNOZ s30, the configurable control systems PNOZmulti and the automation system PSS 4000 monitor the following: standstill, (over)speed, position, shearpin breakage, speed range and direction of rotation in compliance with EN ISO 13849-1 up to PL e. Further parameters such as the oil and generator temperature, vibration as well as electrical parameters can also be safely monitored. All three solutions can either be implemented with one individual (safe) encoder or with two standard encoders (incremental encoders and proximity

sensors). The standard encoder in connection with the proximity switch is a two-channel, redundant and diverse system.

In order to meet the high technical demands with regard to safety functions, the speed monitor PNOZ s30 has a dual-channel control architecture throughout. The two different signals are evaluated as a dual-channel overall system. The speed monitor PNOZ s30 can be used as a standalone module for safe monitoring of standstill, speed, position, speed range and direction of rotation in accordance with EN ISO 13849-1 up to PL e and in compliance with EN IEC 62061 up to SIL CL 3. PNOZ s30 is furthermore provided with a North American UL/cUL approval that is important for its use on an international basis and is certified by TÜV.

The configurable control system PNOZmulti monitors speeds with special motion monitoring modules. Depending on the base unit, up to eight of the modules may be used for monitoring one or two axes in each case. PNOZmulti 2 enables connection to all common incremental encoders via the industrial Mini I/O interface. The modules and monitoring functions are configured quickly and easily via the tried-and-tested software PNOZmulti Configurator.



Safe analogue value processing

By means of the automation system PSS 4000, all relevant functions can be monitored and controlled in order to ensure the safety of the wind turbine. Safe analogue value processing of system values makes it possible to not only control the speed, but also to calculate values such as the acceleration in the event of sudden wind gusts and to control the system correspondingly. What's new is the I/O module for safe speed monitoring for the automation system PSS 4000. The I/O module is also able to

monitor safe speed, the direction of rotation and stop functions up to PL e only using one speed encoder.

Operators benefit from reduced reaction times, a higher productivity and simplified maintenance and repair of their wind turbines.

Webcode:
web11119

Online information
at www.pilz.com

Retrofit for good tobacco

In an extensive plant for the processing of raw tobacco, Pilz has implemented a modern safety management system, reconciling productivity with safety. In addition to the multifunctional light grid PSENopt Advanced, the safety gate system PSENsgate is used.

With several production lines, the Imperial Tobacco Group processes up to ten tons of tobacco per hour at Joure, Netherlands. By means of various process modules and levels, tobacco leaves are distributed and processed step by step until they reach the stage of the ready-for-sale fine-cut tobacco. For retrofitting the plant, Hermos AG and Imperial Tobacco together assigned Pilz with the implementation of the safety concept. Now the plant is running at full speed again – with increased productivity.

Complex requirements with regard to quality

Hermos AG, active in the fields of automation and information processing and with extensive experience in the tobacco sector, had been assigned the task for retrofitting the plant. “The scope of tasks included the modernisation and re-automation of the system, the replacement of switch cabinets, the cabling, installation and finally the implementation of a safety concept”, Volker Sachs, project manager for electrical engineering at Hermos, summarises.

It was the plant operator’s objective to achieve a higher degree of automation and a significant increase in productivity. The requirements with regard to safety were just as high: In addition to maximum protection for the operators in the plant environment, the safety concept was to limit processes, the operability and the performance of the plant under no circumstances.



The hazards detected in the context of the risk assessment process among other things are adequately responded to by Pilz by the safety gate system PSENsgate, as shown here with the machine covers or access points to the warehouse.

Design and implementation from one single source

Imperial Tobacco demanded safety from one single source. In order to fulfil these tasks, Hermos once again brought in its preferred partner Pilz. During all stages, Imperial Tobacco attached great importance to reduce the variety of components to a minimum in order to minimise downtimes in the event of an error and to facilitate service and maintenance operations. Pilz supplied those safety-relevant components that were required for implementing the safety concept developed by Hermos. “Just as in the previous projects, Pilz provided us with open-minded and goal-oriented support again when it came to selecting the products and implementing the customer requirements”, Volker Sachs emphasised.

Access always under safe control

The modernised plant basically consists of complex transport and conveyor systems, the

filling areas and areas for temporary storage, production and processing machines and the warehouse and recipe management.

In several places of the extensive plant, adequate response must be provided with regard to the hazards detected in the context of the risk assessment process. In particular the machine covers of the access points to the warehouse must be safely monitored and measures must be ensured, causing conveyor belts, drives and machine parts to come to a safe standstill in the case of an emergency. The safety gate system PSENsgate by Pilz combines safety gate monitoring, safe guard locking and emergency stop, request and acknowledgement buttons in one system. It is designed up to the highest category PL e. In addition, a coding system provides for maximum protection against manipulation and defeat. Especially in the case of machines with a particularly high danger potential, PSENsgate offers maximum safety.

Tipping without a hazard potential

Without corresponding safety precautions, the heavy container tilting devices would pose a considerable hazard potential. Here the light barriers PSENopt Advanced by Pilz provide for safety. The freely parameterisable light barriers offer a high degree of flexibility: Muting, blanking or cascading can be carried out even over long distances with only one light barrier. PSENopt Advanced protects against insertion and access and, thanks to the muting function, only accepts the containers intended in its monitoring field. With their continuous single beams, the light barriers even exclude so-called dead zones.

Supported by the software tool PSENopt Configurator, the alignment, configuration and commissioning were carried out easily.

In the end, it was possible to significantly increase productivity; the protective measures are discreetly acting in the background and are scarcely noticed by the operators in practice. “The coherent and universal concept, the know-how and the fair price-performance ratio all are points in favour of Pilz”, Volker Sachs summarises.



With regard to the matter of safety, the whole plant was divided into three separate areas that are separated by means of eleven light curtains and four access controls and actuated and safely monitored via Pilz enabling switches.



3 minutes with ...

... Dietmar Döttling

Senior Manager Product Development for the department of sensor systems

► Mr Döttling, what are you currently working on?

Currently we are testing new sensor technologies such as the safety shut-off mat, a tactile sensor technology for human-robot collaboration (HRC). In addition, we are busy enhancing products including camera systems such as the safe 3D camera system SafetyEYE.

► Why is it that even ten years after its introduction, SafetyEYE still is the only safe 3D camera system?

That’s what I’ve been wondering about as well. We know that our competitors have worked on such systems or that they are still working on them. However, I can only speculate about why there is no comparable system on the market. At any rate, we’ve been able to use the time and optimise our SafetyEYE further on the basis of the experience that we’ve gained.

► What exactly has been happening with SafetyEYE since it was introduced on the market?

For one thing, we have continuously improved the hardware. This for instance includes the miniaturisation of the processing unit, enhancements of the process boards or the development of lens hoods for the sensor unit. With regard to the firmware and the SafetyEYE Configurator, we were in particular able to improve the set-up process and stable operation by means of numerous functional extensions.

► What do you think is the greatest advantage to the user?

The greatest benefit for the users will be the flexible design of the protection zones and the possibility of logically linking the protection zone information. This flexibility cannot be experienced at all or only to a limited extent with other

optical safety devices like for example light barriers or laser scanners. This yielded such a great variety of applications, which neither me nor my colleagues would have ever dreamed about.

► May we take a brief look into the future: What will the future of sensor systems look like?

The demand for SafetyEYE systems is currently increasing, which has to do with the subject of HRC. Here I see great potential, because SafetyEYE is the only safe system that is suitable at all for detecting objects in the proximity of a robot and for responding to these objects dynamically, for example by evasive movements of the robot. This will still require some enhancements of the firmware and of the external interfaces.



Especially for HRC I see another trend: Sensor fusion. One single sensor will not be able to provide for such complex safeguarding processes. This means there’ll have to be further sensors, possibly with different technologies, used in combination. At Pilz we are already testing corresponding technologies.

Webcode:
web6474

Online information
at www.pilz.com

Susanne Kunschert in the VDMA chairmanship



Susanne Kunschert is the new deputy chairwoman of VDMA Baden-Württemberg. This enables the Pilz managing director to actively control the destinies in the national association. The VDMA represents the sectors of mechanical engineering and plant engineering in Germany. Dr. Mathias Kammüller, managing director and chairman of the Machine Tools division at TRUMPF GmbH + Co. KG, was elected as the new chairman of VDMA Baden-Württemberg.

Strong community for worldwide machinery safety

For Pilz, machinery safety is a global task that can be solved best by working together. With the CMSE® – Certified Machinery Safety Expert Community, Pilz is now creating the first platform for the international exchange among practical experts on the subject of machinery safety.

Together with TÜV Nord, since 2013 Pilz has offered the qualification as CMSE® – Certified Machinery Safety Expert. More than 1,600 experts in over 40 countries have successfully passed the corresponding examination. "This certification is a verification of our expertise for examining the fulfilment of all safety requirements together with the mechanical engineer", Robert Van Bommel, technology manager at SCA, a global manufacturer of hygiene and tissue products, explains. He has recently successfully obtained the CMSE qualification. "This reinforces our role and improves collaboration. I am proud of having obtained this qualification. My know-how and experience that I have gained in many years have helped me on the path to my success. The qualification actually was quite challenging, but like this I was able to demonstrate my expertise."

At www.cmse.com, the graduates can now network and access exclusive and practice-oriented contents. In the newly created community, all persons promoting occupational safety around the globe are able to network. This creates a global community of experts from the field of machinery safety. In an individual area at www.cmse.com, members of the community



are provided with news relating to specialised and relevant innovations that are generated and processed by Pilz experts.

Exclusive downloads with white papers, information on the international legal situation and standard situation and technical documentation top off the range of information.

In issue-focused forums, the members can furthermore exchange views, ask questions and share their experiences with other

members. Each CMSE® automatically has free access to the community. Persons who are not CMSE® yet, are provided with all information on how they can obtain the certification at www.cmse.com.

Online information at www.cmse.com

► Profiles Pilz Switzerland is celebrating its 20th anniversary

Retrospective – panorama – outlook

"Retrospective – panorama – outlook": The panorama on the mountain summit of the Stanserhorn provided the perfect setting for the 20th anniversary celebration of Pilz Switzerland. Together with the Pilz family, the Swiss subsidiary used this opportunity to thank its customers, partners and companions for their trust and cooperation.



First safely to the top, then safely to the ground again: Pilz Switzerland organised its anniversary celebration with its long-standing customers on the Stanserhorn in the Swiss Canton of Nidwalden.

True to the motto "Retrospective – panorama – outlook", the "retrospective" started with the collective "climb" in the Oldtimer Railway, a funicular railway that is almost 125 years old, which since this spring has been controlled by means of the automation system PSS 4000. In the mid-station, all guests were treated to a short tour – a "panorama" – through the Stanserhorn railway technology. As they continued their way, the guests were able to enjoy the "outlook" from the open upper deck of the worldwide unique "Cabrio" train to the Stanserhorn. The rise also reflected technical milestones of Pilz: In addition to the control system PSS 3000 that was developed twenty years ago, the automation system PSS 4000 that is "Industrie 4.0 capable" with its new web-based PASvisu visualisation solution is used. "Both Pilz's innovative strength and its continuity and down-to-earth quality are reflected in these cableway projects at the Stanserhorn", Renate Pilz emphasised. There, on the mountain station in the revolving "Rondorama" restaurant, the close to one hundred guests celebrated with music and good food.

"Pilz is feeling comfortable in Switzerland. Because here the quality and efficiency of solutions are of

extremely great value. We encounter customer with a distinctive quality awareness, who always approach us with interesting and sometimes extraordinary requests. They rely on our expertise and our ability of successfully striking out new paths", Renate Pilz says in her speech to the guests.

However, thanks and praise were also given to the persons within the company: Renate Pilz and Susanne Kunschert also seized the opportunity to acknowledge the commitment shown by the employees of Pilz Switzerland: "All our employees deal with their work and approach their tasks with great humanity and a profound technical know-how. This is the trademark of Pilz Switzerland", both women emphasised unanimously.

It was in 1996 that Pilz Industrieelektronik GmbH was founded as the tenth subsidiary of Pilz. Today, 15 employees are supporting and supplying the Swiss customers with components, systems and services for safe automation from Mägenwil (Canton of Aargau). In addition to mechanical engineering and plant construction as well as the production industry, the areas of application also include the fields of cable car and railway technology.

Visualisation from one single source

The efficiency of a visualisation solution depends on how it is embedded in the hardware and software concept of a plant. With its PMLvisu visualisation solution, Pilz focuses on a particularly close collaboration of hardware and software.

PMLvisu consists of Pilz operator terminals PMI on which the web-based visualisation solution PASvisu is pre-installed and licensed. The operator terminals work with the Windows Embedded Compact 7 (WEC7) operating system and is available with a capacitive glass touch-screen in two sizes, 7" or 12". Like all Pilz operator terminals, the PMLvisu devices are also developed, designed and produced in Germany and, due to the LED backlight, have a longer service life.

Thanks to the runtime environment, for visualisation projects the terminals can be combined with the control systems PSSu PLC in the automation system PSS 4000. This makes it possible for the users of Pilz control solutions to fully operate, diagnose and monitor plants.

PASvisu is linked directly with the control project, making it possible to directly access each existing variable without having to import or create them manually. Thanks to the direct project link with the control project, the person creating a visualisation is always up to date. In

addition to the process variables, all system and diagnostic information such as the firmware version or the IP address of the control system is provided. This makes it possible to fully exclude any errors and makes it considerably easier for the user to orientate himself in the system later on. This is of particular interest if extensions or revisions on the control system are carried out later. Documentation is virtually carried out as a sideline by self-explaining, symbolic designations.

The benefits can be seen in greater availability due to local error reactions, higher productivity as a result of shorter reaction times across the whole system and the ability of the user to react faster.

Webcode:
web77550

Online information
at www.pilz.com



► Inside New firmware release 14 for the automation system PSS 4000

“Did you know this?”

Safe, cross-project communication.

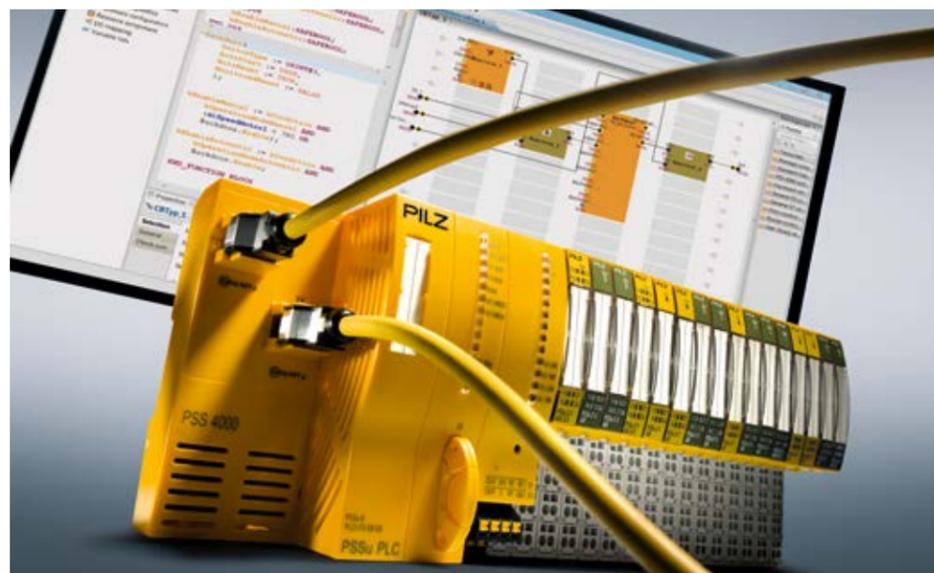
The new firmware release 14 for the automation system PSS 4000 in particular is more convenient when dealing with automation projects. In the software platform PAS4000, users are now given the opportunity of exchanging process data of several individual projects via SafetyNET p RTFN. This advantage is mostly used if projects are generated separately from each other and are combined at a later time (multi-user function). With this cross-project communication, each project can read the variables of other projects and write to the variables of other projects. The unique feature of this is that these cross-project connections are always established in a type-related fashion, i.e. only variables of the same type can be interconnected – no matter whether you are dealing with automation or failsafe data – and this is effected without any additional hardware such as bridges or data couplers. The file

mapping function provides for identical handling within and outside of a project. The integrated testing and monitoring functions of PAS4000 avoid errors, relieve the programmer and thus provide more user safety. These communication connections are organised by means of the new software PASconnect.

With release 14, users can now individually encode their projects. The corresponding control systems contain a lock mechanism that can be activated, so that the designated projects can solely be executed on the devices intended for this purpose. In addition to the protection of know-how, OEMs and mechanical engineers are therefore provided with the advantage of being able to safeguard warranties in the service and spare parts business.

Webcode:
web88875

Online information
at www.pilz.com



Apropos ...

With Mat P. on his automation tour

Whether he is dealing with applications from the fields of packaging, automotive, traffic engineering, metal processing –

as an expert, Mathias P. is on business worldwide with automation solutions by and for Pilz. His wife often asks him about his trips ...



PNOZmulti
APPLICATIONS

► **Mat, what has actually happened to the subject of fuel cells? It was considered the technology of the future for producing energy in an entirely environmentally friendly fashion.**

The technology is still of topical interest. Numerous car manufacturers from Asia and Germany are enhancing the technology and in some applications this technology is actually already used.

► **And where?**

Well, for example for the power supply on signal systems, radio masts, telecommunications distributors and other off-grid energy consumers. There fuel cell systems are installed on site instead of the Diesel units that are not very environmentally friendly. And compared to solar systems, the fuel cell does not require expensive battery buffers and is practically always ready to use.

► **And how do you know that?**

Well, our customer EMB Elektromotoren und Gerätebau Barleben GmbH is developing these compact fuel cell systems. They are subject to safety-relevant regulations and standards. We have elaborated and implemented the safety concept together with EMB.

► **And what is the concrete solution?**

The gates of the plant are secured by means of magnetic gate switches PSEnmag so that they cannot be opened unintentionally or deliberately. And thanks to the operating mode selector switch PITmode, the service employee is able to carry out his maintenance work on the plant safely. And finally, the configurable control system PNOZmulti 2 monitors the safe signals of the gates and the emergency stop button.

► **Therefore the solution is not only environmentally friendly, but also safe. Those are the best prospects!**

PMCprimo C: More power for the drive!



The drive-integrated motion control system PMCprimo C is newly equipped with a 1.3 GHz Intel Atom processor and thus has more power: It is now possible to obtain larger programs at the same cycle time or shorter cycle times at the same program size. This increases productivity.

Due to their higher performance, the motion control systems can be used in a variety of further applications with immediate effect – complete applications in all drive environments such as pick-and-place applications,

consisting of the PLC control functions and the motion control functions, can be implemented.

In the case of the space-saving motion control solution PMCprimo C, the motion control card can be easily inserted into the PMCprotego D servo amplifier. If the application is to be safe, the PMCprotego S safety card can be inserted to generate a safe and compact drive solution. This saves space and costs, since the safety functions are already included in the drive.

Webcode:
web5531

Online information
at www.pilz.com

All software updates at a glance



With PASupdate, users of Pilz software solutions are always informed about all innovations. The software PASupdate is provided for download on the Pilz website free of charge. After installing it on their PC, users are provided with a current overview of all available updates any time. New or pending updates can be detected at a glance. By clicking on the corresponding release, the download can be directly started from PASupdate. Readme files can also be easily downloaded and updated via PASupdate. Furthermore the integrated news area provides information

about current developments of the Pilz software products. PASupdate is available in German and English. Registered users can download the application free of charge and without any obligations.

Webcode:
web87857

Online information
at www.pilz.com

Complete set for the validation of HRC



The annex of the Technical Specification ISO/TS 15066 for human-robot collaborations describes a body area model. It provides limiting values for each part of the body in the event of a collision between man and machine. If the application remains within these limits during contact between man and robot, it conforms to the standard.

For the measurement of force and pressure and for the validation in compliance with ISO/TS 15066, Pilz has developed a complete set. Apart from the collision measuring device with foil and a scanner, the set contains various springs and a measuring software by means of which measurement

processes and logs can be generated. The collision measuring device equipped with springs and corresponding sensors exactly measures the forces acting on the human body and compares them to the limit values. A one-day product training with regard to the collision measuring device tops off the set package.

Pilz offers the complete set on a rental basis. It includes maintenance, calibration and updates at regular intervals. By the exact measurement, the measuring device contributes to increase the productivity of HRC applications.

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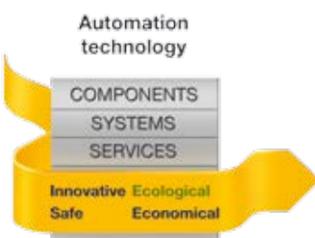
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