

# MENSCH und AUTOMATION

**PILZ**  
THE SPIRIT OF SAFETY

The magazine for customers of Pilz GmbH & Co. KG Issue 3/2017



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# “Innovation is in our DNA”

It is equally true of companies and society: Continuing to develop is essential. Pilz has always continued to develop: from glass-blowing in the 1940s to producing transistor-based timer relays in the 1960s to industrial control electronics in the 1970s to Industrie-4.0-compatible automation solutions today.

At all periods of development, the joy of innovation was the driving force. “The power of innovation is in our company’s DNA,” says Renate Pilz. Pilz has made industrial history with products such as the Pilz PNOZ emergency stop relay; PSS 3000, the world’s first safe programmable controller; and SafetyEYE, the first safe 3D camera system.

Pilz systematically builds up its competencies and capacities in the areas of development and production and the company does this internally and thus sustainably. The strategy is to take up innovative ideas and make them marketable and

ready for industry. Because, as Renate Pilz says, “Technological leadership is the only thing that ensures market leadership.”

At Pilz, development is divided into two departments: One is Advanced Development (AD), which is interested in the development of technologies. The other is Product Development (PD), which is primarily concerned with developing products to series maturity. But the issue of innovation itself rests on an even broader foundation at Pilz, one that runs through the entire company: In addition to the development departments, such departments

as Purchasing and Production Technology are responsible for innovations: Pilz places great importance on innovative suppliers who are able to deliver new materials, for example. New processes also require new procedures or test criteria in production. The entire company must focus on innovation. Only then can innovation be sustainable.

### Internal and external ideas

On the one hand, ideas come from employees who are able to tackle this challenge in a motivated manner and drive development forward.

But ideas also come from culture, from the spirit of a company. Culture can only succeed if it is actively promoted and modelled by management. Ideas also come from outside. “We are fortunate that our customers approach us with interesting, sometimes unusual questions. They rely on our expertise and ability to break new ground,” says Renate Pilz.

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# Editorial



Dear Readers,

Industrie 4.0 will have a special impact on “safe automation”. At Pilz, we view safety and security as inseparable, together forming an indispensable prerequisite for the success of Industrie 4.0.

While Industry 3.0 was the age of automation and IT, Industrie 4.0 can be viewed as the age of autonomy. Autonomous vehicles, robots, and machines operate together at runtime and have to immediately function effectively and be able to fulfil their tasks. Here, even greater tasks in the area of CE marking must be solved. When such autonomous systems meet at runtime, neither time nor resources are available for the conformity assessment procedure as we know it today (with risk analysis, implementation, validation, and CE marking).

The number of autonomous systems will increase significantly, many of them in the context of human-robot collaboration. Pilz is already at the forefront of implementing such applications with users. We will cement our role as pioneer of safe automation technology with yet more innovations.

Best regards,

Klaus Stark, Head of Innovation Management, Pilz GmbH & Co. KG

► 360° Continued from page 1

The know-how that Pilz has built up over decades of experience in automation and safety technology is also inextricably linked to institutions and research facilities. A large part of the product innovations Pilz has launched in recent years have been in close partnership with technology-oriented institutes. In addition, Pilz is involved in research platforms such as SmartFactory KL, Arena 2036, and the Industrial Internet Consortium.

Pilz intends to further cultivate and enhance its innovativeness with the newly created “Innovation Management” field office. Klaus Stark, who has already been instrumental in shaping Pilz’s path both as Head of Product Management and as Head of International Sales, is in charge of the field office.

of time periods called “sprints”. Within a sprint, intermediate steps are created with a view to the product’s functionality. Agreed quality criteria must be met in the process.

The departments involved are development, production technology, purchasing, product management, customer support, marketing, and sales. Since all of them work closely together from the start, and all team members are constantly giving and receiving feedback, development is more agile, and any misunderstandings can be identified and resolved at an earlier stage.

For faster product development, Pilz has also adopted a modular, platform-based approach. It identifies software functions which, for example, are developed as reusable modules that can be



Pilz is continuously expanding its research and development activities: It can carry out precise assessments of the electromagnetic compatibility (EMC) of its products in the new accredited test laboratory.

“Innovations can only succeed if entrepreneurship is put into practice – entrepreneurship in which risks are evaluated, but also taken,” says Stark.

With Pilz, this can be seen in the many international patent applications, the number of people working in R&D, and the above-average R&D rate: Every year, Pilz invests 20 percent of its turnover in research and development.

One example is its headquarters in Ostfildern. By relocating production to the Peter Pilz Production and Logistics Centre at the end of 2015, the company created space in Ostfildern for expanding its R&D capacities. To this end, Pilz is converting what used to be the production and administration building into a state-of-the-art research and development centre. Approximately 7 million euros will be invested in the headquarters.

#### Agile product development

In addition to having a forward-looking infrastructure, Pilz is also innovative in its processes and procedures, using agile product development methods such as Scrum, in which the product is developed step-by-step in a series

deployed in future Pilz products – at market-ready product quality. “This enables us to optimize development work, but that’s not all: We can also offer total solutions, in line with market requirements, that can encompass control and sensor technology, for example, linked optimally via visualization and diagnostics,” says Thomas Pilz.

Innovation is thus the link between the past and the future, between customers and the company, or, in other words, “the driving force”, the central theme, the DNA of Pilz. Together with its focus on the market and on customers, it ensures the future viability and agility of the company and of its products and services. ◀

## The new Ostfildern R&D Centre

Development and testing laboratories are being set up in former production areas at Pilz’s headquarters in Ostfildern. Mechanical testing equipment and climatic chambers may also be used for testing products up to protection class IP 67, with offices and meeting and project rooms grouped around the laboratories.

Our “Technology Centre” also includes machine models such as robot systems which can be

used to perform technology and product tests under practical conditions. This will allow equipping machine models with Pilz products during development, especially in advance development. For example, networking requirements can be efficiently implemented in our products so that they can be tested under conditions that are as close as possible to real application.

# “No energy without friction”

The editorial team of “GIT Sicherheit + Management” interviews Renate Pilz, Susanne Kunschert, and Thomas Pilz about the generational change, innovations, and the human factor.

► Mrs Pilz, you have announced that you will step down from your active management role at the end of 2017 and pass the baton to your son and daughter. What prompted you to make this decision right now?

**Renate Pilz:** I am very grateful to be able to hand the company over to my children now. The past few decades have been good ones – and there is a time for everything. It is very nice to be able to see how my children, who have been working together for ten years, will continue to run the company now. It is a pleasure to know that Pilz will continue to be in good hands.

► This makes the challenging business succession at Pilz function very smoothly – many companies resort to external help for such matters.

**Renate Pilz:** That's right. Another reason we do not need such support is that all three of us work in clearly defined, independent areas – and we treat each other with respect.

**Thomas Pilz:** But this mutual respect also involves acknowledging that things can't run smoothly all the time. We discuss issues thoroughly and reach a conclusion. This is important because it is the only way to achieve good, sustainable results.

**Susanne Kunschert:** We don't coddle each other – but we don't think or work in a power-oriented way, either.

**Renate Pilz:** I think that's right. There is no energy without friction – and energy is what we need in the joint management process. Agreement on this point allows us to run things without external help. We are united by our sense of responsibility for our employees and customers.

► Continuing Pilz as a family business with certain values is very important to you. To what extent can it be achieved in the face of constant economic and technical change?

**Thomas Pilz:** We think that the anyone who puts his economic and ecological values in the foreground and asks questions instead of viewing quick profit maximization as the measure by which his actions are assessed will be successful in the end. Our company's positive development confirms this view.



Pilz completes the generation change: At the end of 2017, Renate Pilz (centre) will retire from her active role in management and hand over control to her daughter, Susanne Kunschert, and her son, Thomas Pilz.

► How are the responsibilities divided right now?

**Susanne Kunschert:** My brother and I have each assumed half of the responsibility.

**Renate Pilz:** My son, Thomas Pilz, is responsible for IT, Purchasing, Research and Development, Quality Management and Production – and my daughter, Susanne Kunschert, is responsible for Finance, Human Resources, Product Management, Marketing, Sales and Customer Support.

► Pilz is an automation company with the core competence of safety. Where is the company headed in terms of safety and security?

**Thomas Pilz:** Let me put it this way: Traditionally, we protect people from machines. Now, the digitalization of production has had several consequences: In addition to safety for the protection of personnel, we also have to protect our machinery from malicious people, sabotage, and attacks – which is why security is an increasingly important issue. Developments in connection with Industrie 4.0 have made us all aware of the vulnerability of our industrial apparatus. We address the corresponding security not only

with hardware and software, but also with services – because operator responsibility is also part of the equation. More than ever before, he must protect himself from malware and keep the products in question up to date. At Pilz, we ensure the performance of our control systems and enable reactionless updates.

► Let's take a closer look at the issue of human-machine collaboration. Could you give an example of what Pilz products and services contribute in this area?

**Susanne Kunschert:** First of all, man and machine have been working together ever since machines were invented. But, roughly speaking, it usually involved the person pressing buttons and the machine doing its work. Today, it is becoming increasingly common for man and machine to complement each other in the working process. But this means that we need new protection concepts. Thick protective barriers separating man and machine make the new form of cooperation more difficult. That means that we need to rethink our protection concepts and offer different sensor technology.

► Can you give examples of new developments that illustrate this change in perspective?

**Susanne Kunschert:** Take for example our new position detection safety mat, our safety laser scanner, or the new generation of our three-dimensional SafetyEye camera.

► You invest in the expansion of research and development activities – and the concern there, besides product development, is “the development of cross-product technologies”. Could you explain that last with one or two current examples?

**Susanne Kunschert:** You can't get a product such as the position detection safety mat onto the market within twelve months. It requires advance technological development. A system reference must be developed for the individual components.

**Thomas Pilz:** Developing a mat or the position detection is well and good – but I also have to get the robot control system right. An interface has to be developed – and I always have to ask, “What is the real utility I want to achieve?” The product can't get too expensive, either, or it stops being attractive to the customer. Advance development makes economical solutions possible by developing individual parts, for example, in such a way that they can be installed in different products. In a sense, advance development is the link between basic and applied research.

► You also work with “agile” product development methods such as Scrum. What is the advantage there?

**Thomas Pilz:** With Scrum, I can concentrate on what I want and what really works. The development team has to deliver results earlier with this method. They have to think and work across disciplines. Everything is faster and more efficient.

**Renate Pilz:** By the way, the Scrum method has another advantage which is very nice to see: People are starting to meet personally more often. With all the digitalization and computer work, it strengthens the human factor – and remains efficient.



The complete interview appears in “GIT Sicherheit + Management”, issue 11/2017.

[www.pilz.com/generational-change](http://www.pilz.com/generational-change)

## In brief ...

### Poster: Protective measures for machines and systems



The "Protective measures for machines and systems – important harmonized standards according to the Machinery Directive (2006/42/EC)" poster provides an overview of the most important A, B, and C standards that manufacturers of machines and systems must observe in order to achieve functional safety.

The type A standard listed is EN ISO12100 (basic safety standard), followed by the B standards, which deal with certain aspects of machinery safety or certain types of safeguards that can be used across a wide range of machine categories. The poster also refers to the corresponding Pilz products and provides further information.

It can be ordered from Pilz by e-mail ([marketing@pilz.de](mailto:marketing@pilz.de)) or downloaded at [www.pilz.com](http://www.pilz.com) (search term: poster).

### PNOZsigma:

#### Safety even at over 2,000 m

Since September, use of all PNOZsigma safety relays (versions for direct current (DC)) has been possible even at altitudes of more than 2,000 m. The safety relays have been specially refined to work reliably at these heights even under increased loads. Extensive tests and height simulations have proven their suitability.

► Inside PSENmat safety mat combines safe area monitoring and machine operation in one sensor.

# Safety in all dimensions

The new PSENmat safety mat completes Pilz's sensor technology range for monitoring areas and rooms. What's special about it: PSENmat combines safe area monitoring with plant and machine operation in one sensor.

Combining safety, productivity and ergonomics for machines means that safety may no longer be only selectively effective. The PSENOpt safety light grid, the PSENscan safety laser scanner, the SafetyEYE and PSENVip safe camera systems, and now the PSENmat safety mat: With a complete range of sensors which are able to monitor areas as well as rooms, Pilz is opening up new possibilities for dynamic safety concepts.

Tactile sensors, such as safety mats, are particularly well-suited to safe area monitoring. Safety mats are pressure-sensitive safeguards which react to contact or pressure and meet the requirements of EN/ISO 13856-1. Hazard points and danger zones are secured by reliably detecting the trigger and passing it on to the safe control system for further processing.

Safety mats slow down or stop systems and machinery when someone enters the hazardous area (= access protection) and also provide rear-area protection. After all, it's essential to monitor not only access to the danger zone but also the zone behind it, in order to prevent the plant or machine starting up unintentionally.

Safety mats have a wide range of applications: They are mainly used in systems that are obstructive, whose layout makes them difficult to monitor, or that suffer limited visibility due to dirt and dust, for example. They are also suitable for protecting workspaces shared by humans and robots.



## Safety mat PSENmat

With PSENmat, Pilz is now introducing an entirely newly developed safety mat. Integrated position detection, enabling new machine operating concepts, is a world first. For example, the worker can use an integrated foot-operated switching function via previously defined and marked mat areas and work freehand. In addition to the classic safety function, PSENmat is equipped with position detection (standard). One mat can be divided into 40 fields. It thus offers customers high added value: A freely parametrizable operating or acknowledgement function – similar to a virtual pushbutton – is available to the operator in each field. PSENmat combines safe area monitoring with plant and machine operation in one sensor.

PSENmat can be easily connected to the configurable PNOZmulti safety systems or the PSS 4000 automation system. The switching states on site are easily displayed via the PASvisu web-based visualization solution. In conjunction with Pilz control technology, this allows a complete solution that is safe and economical.

Webcode:  
web187956

Online information  
at [www.pilz.com](http://www.pilz.com)

► Inside Pilz at SPS IPC Drives 2017

# Dynamic safety solutions as a visitor magnet

At SPS IPC Drives 2017 in Nuremberg, Pilz showed how humans and machines can work together more closely, and therefore more productively, as well as more ergonomically thanks to dynamic safety solutions.



The numerous visitors to the Pilz stand experienced, for example, how humans and robots can work together without a protective fence thanks to dynamic safety solutions: within a human-robot collaboration, the position of the human is safely detected via external Pilz 2D and 3D sensor technology, which is not integrated within the robot. Depending on the application, various products such as the PSENOpt light curtain, PSENscan safety laser scanner, SafetyEYE safe 3D camera system, the new PSENmat safety mat, or a combination of these systems ensure safety.

### Industrie 4.0 at your fingertips

A prerequisite for flexible, smart production is the intelligent networking of autonomous system modules. At the exhibition, the company used the Pilz Smart Factory to show how individualized products can be manufactured

sps ipc drives



Nürnberg, 28.–30.11.2017

under mass production conditions in a process that is fast, flexible and cost-efficient. All the components come from Pilz, from the sensor and drive through to the controller. The automation system PSS 4000 performs the control tasks in the Pilz smart factory: it can be used to program control functions for the whole plant centrally in one tool – these are then distributed to the various PLC controllers with ease. This saves time and avoids errors.

Webcode:  
web167671

Online information  
at [www.pilz.com](http://www.pilz.com)

# Safety for the “Cookie Company”

In its Belgian plant in Herentals, the food manufacturer Mondelez has compared a conventional safety solution with a modern one – and came to a clear decision in favour of Pilz’s SafetyEYE three-dimensional safe camera system.

When cookies are baked at Mondelez in Herentals, Belgium, full-height mixers and stirring machines are used. With an annual output of 65,000 tons, the cookie factory is one of the largest in the world. 1,200 employees produce branded products such as LU, TUC, and Milka.

## Barrier-free machine handling

As a rule, two workers operate the dough mixers, each with a capacity of around 800 kg. The agitator drums, which are equipped with rotating mixing and kneading tools, are loaded and unloaded from the front. However, no safety fences, light beam devices, or safety mats are to be seen anywhere. The dough mixers stand freely in the room and workers operate the machines essentially barrier-free. Safety is nevertheless guaranteed: If the workers look up, they will see the SafetyEYE safe 3D camera system on the ceiling.

In 2015, the Herentals management tasked Pilz Belgium with optimizing the dough mixer application safety standards, bringing them in line with the state of the art. The requirements included further simplifying the operating procedure and increasing productivity. A contradiction? Not at all, because one feature of modern safety solutions is that they do not impede operating and production processes.

## Conventional or innovative?

At the beginning of the project, however, Mondelez was still somewhat uncertain whether to use a powerful conventional or a highly innovative solution. The management decided to test both variants in everyday use in a pilot project and evaluate the results.

“In the classic variant, light beam devices and protective fences were the essential elements of safety provision. For reasons of hygiene, special demands were placed on installation and design. This means that, while the required safety standards can be met, the solution does not always meet our expectations of uncomplicated handling,” says Koen Matheussen, Engineering Manager at Herentals.

The innovative version is based on Pilz’s SafetyEYE three-dimensional safe camera system. Mounted on the ceiling, three integrated cameras monitor the entire mixing and kneading system. Protective fences and other obstacles on the ground are no longer necessary.

## Virtual safety fence

The Pilz SafetyEYE Configurator allows virtual warning and protection zones to be easily created on or around identified hazardous areas. An intervention in a defined warning area (yellow) does not constitute a danger to the operator per se. However, a warning light and/or an acoustic signal indicate that the worker is approaching a safety-relevant area. Thus warned, the operator can adjust his behaviour while the machine continues to work. Only when SafetyEYE detects a violation of a safety zone marked as red does the safety software trigger a coordinated safety-oriented action: The system or subsystem stops, and the drive moves into a reduced, safe mode; at the same time, a red warning lamp lights up, and a warning signal sounds. Before the system or subsystem can return to production mode, the operator must leave the safety-relevant area, acknowledge the current mode, and activate restart.

In many cases, conventional safety solutions react to interventions in protected areas by initiating a safe shutdown of the entire system. Restart often involves a great deal of time and effort. With its flexibly structured, definable virtual protected areas, SafetyEYE offers a range of reaction options.

SafetyEYE even distinguishes between the different container sizes used in the dough mixer and reacts accordingly.

## SafetyEYE was the first choice

At the end of a six-month test phase, Mondelez was faced with the final evaluation of the two variants. Result: both variants met the required safety standards. However, as Koen Matheussen relates, “At the end of the pilot phase, after a thorough evaluation and the detailed adjustments and optimizations carried out in cooperation with Pilz, it was our machine operators who were clearest in their preference for Pilz’s safe camera system.”



Dangerous situations can occur with Mondelez dough mixers, especially when the machines are being filled and emptied.

## Three minutes with ...

# ... Hansjürgen Horter

Senior Vice President Technology and Development

► Mr Horter, you have been Senior Vice President Technology and Development since July. What role does R&D play at Pilz? How is the division embedded in the company?

It plays an enormous role! Pilz rightly enjoys the reputation of being a technology leader. Innovativeness is one crucial element, but the high quality of the products is also beyond question. That is why we work closely with product management, production engineering, quality management, or customer support right down to the project level.

Beyond Ostfildern, which encompasses the advance development and product development departments, development at Pilz is international: Our international development teams include colleagues in Ireland and at various locations in Germany and Switzerland.

► What challenges will R&D face in the coming months and years?

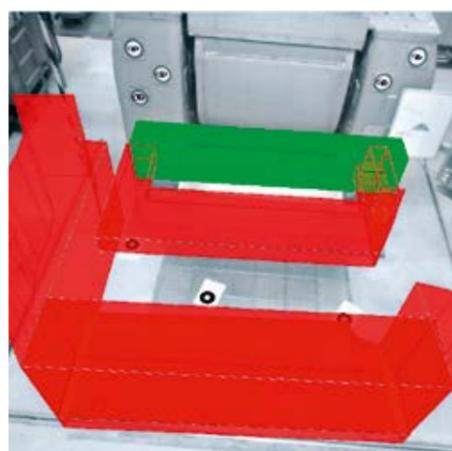
It is no secret that we want to develop even faster and more efficiently; the keywords here are “time-to-market” and “design-to-cost”. At Pilz, we pay particular attention to extending the functions of existing products and to networking. The top priority at Pilz is always that the products remain easy to implement and operate.

► What are the trend issues, and how are they dealt with at Pilz?

Thanks to Industrie 4.0 and robotics, automation in general is trending again. Continuous networking from the component to the cloud opens up new opportunities for the industry. That both inspires and challenges development. Agile working methods such as Scrum are therefore very important to Pilz and help us to remain



innovative. We have a creative development team that works independently. In addition to further evolutionary refinements, Pilz will therefore continue to generate disruptive innovations, scoring big successes such as PNOZ and PNOZmulti.



The SafetyEYE three-dimensional camera system is a visual, extremely flexible safety technology. The spaces defined by SafetyEYE Configurator can be changed and adapted at any time with a mouse click.

# “It depends on what I want to achieve”

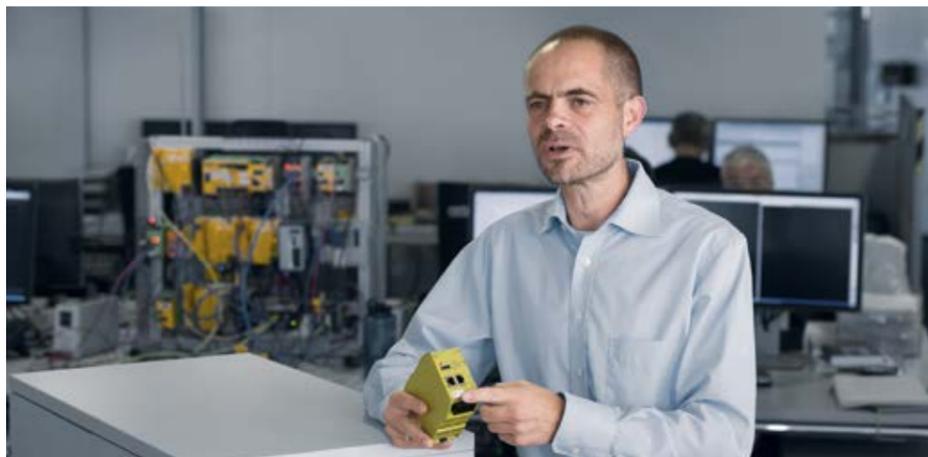
Frank Eberle thinks that protecting safety applications against cyber threats requires a holistic approach to security. He and his team develop security solutions at Pilz.

► Mr Eberle, in the discussions on the subject of security, the large gaps repeatedly draw complaints. What are the potential effects of security gaps?

In general, the effects of security gaps are not initially felt. The danger only arises once an attacker exploits a security gap. We can distinguish between two main dangers: The first is industrial espionage, by means of which an attacker might steal a PLC programme, for example, in order to recreate a machine. The second is sabotage, the effects of which depend on the system or machine in question, but could be fatal.

► What security gaps can occur in industry? What are the main danger sources?

There are no industry-specific gaps; the gaps there are the same ones that are found in the office IT world. Having said that, the industrial environment is years behind office IT. That is why gaps that have long been fixed in office IT remain in industrial settings. Many devices, components, systems, and machines are insecure by design. In other words, security was not considered during development. The greatest danger, however, is social engineering, in which the attacker targets specific users, trying to convince them to release secret data or grant access to the industrial network.



► What technical solutions exist? Are they sufficient?

We can distinguish between two technical solutions. One encompasses the measures around the device, such as a firewall to eliminate network-level attacks; the other involves measures in the devices, such as user action authorization. The solution I choose depends on what I want to achieve. But some can only be implemented directly within the devices.

► What other possible solutions exist?

Long-term we should bear in mind that security is a moving target. This means that security is not a physical parameter. That's why attackers are constantly developing new technologies or well-known algorithms are exposed as insecure. So the software on devices must be updated. The challenge is to design the software so that

a new safety approval is not due on each occasion, either during manufacture or when in the possession of the customer.

► What is Pilz planning in this area?

At Pilz, we are working on making our products secure by design, which means that security is considered across the entire product lifecycle.

This consideration starts with a threat analysis to identify the threats that could impede a component. This is followed by the implementation of measures to counter these threats. Each measure either is in the product in the form of a security function or serves to instruct the customer, who must then implement the safeguard in his environment in order to use the product in a secure manner.

We introduced our Pilz SecurityBridge at the SPS IPC Drives trade fair. SecurityBridge protects the connections between the programming and configuration tools and the hardware controllers from manipulation by detecting unauthorised changes to the automation project, for example.

In addition to security, it provides users higher system availability, since only necessary data (authorized configuration and process data) is transferred.

## Pilz SecurityBridge

Pilz SecurityBridge functions as a firewall. Unlike generic firewalls, however, it requires no complex configuration and can be put into operation easily thanks to application-specific plug-and-play default settings. This means that Pilz offers effective protection against network-

based attacks and unauthorized network access for PNOZmulti 2 configurable control systems and the PSS 4000 automation system.



# Safety for the smart factory

The SmartFactory<sup>KL</sup> technology initiative develops innovative factory systems to test the vision of Industrie 4.0 right now. The focus is increasingly on safety.

In a network of industrial partners, such as Pilz, and research institutes, various working groups form to develop the concepts, standards, and solutions that form the basis of highly flexible automation technology.

The “Infrastructure” working group has developed a dynamic safety concept and achieved practical implementation in the Industrie 4.0 demonstration plant. The concept is based on an industrial Ethernet communication protocol. The physical arrangement of the two production lines separated by a minimum distance makes several independent emergency stop areas possible. If one line goes into a safe mode, the rest of the system can continue production. This can significantly reduce production downtimes in real operation. For the first time, it is possible to flexibly parametrize the emergency stop via individual production lines instead of stopping the entire system.



Currently, the working group is addressing the topic of certification in agile, flexible production. The flexibility of production made possible by Industrie 4.0 means that systems must be

reconfigured and therefore re-certified. This re-certification by independent test authorities can be simplified with a dynamic safety system. There is great potential here if a simplified, partially

or fully automated certification procedure can be used for system expansions or additions.

# Service portfolio at a glance

Pilz offers a comprehensive portfolio of safety and automation services that consists of consulting, engineering, and training.

In this way, Pilz experts help customers worldwide to implement their safety and corporate goals.

Pilz services include safety throughout the machine life cycle, international conformity assessment, safety in the workplace, and an extensive range of training courses.

Pilz is now illustrating its diverse portfolio with a service overview, starting with machinery safety in the design, operation, and retrofitting of the machine or system. In the next step, Pilz's experts ensure that the machine complies with the relevant standards and directives worldwide. Services for machine operators and a wide range of training courses with special qualification programs and certified training measures round off Pilz's range of services.

Over thirty years of experience in the industry make Pilz a reliable provider of machinery safety

services for national and international industrial companies. Pilz offers practical solutions to the most complex safety issues in all industry sectors.

Webcode:  
web7792  
Information about our Services

## Pilz Services for Safety and Automation



### Machinery safety

Safety through the whole machine lifecycle

- Risk Assessment
- Safety Concept
- Safety Design
- System Implementation
- Validation

Safe machinery at any stage



### International compliance

Conformity with international standards and regulations

- CE Marking
- NR-12

Compliant machines worldwide



### Workplace safety

Absolute safety when operating machines

- Plant Assessment
- Lockout Tagout System
- Inspection of Safeguarding Devices

The maximum possible safety for man and machine



### Training

International qualification programme and certified courses

Enhancement of professional development

## ”

## Apropos ...

With Mat P. on his automation tour



PNOZmulti  
APPLICATIONS

Whether he is dealing with applications from the fields of packaging, automotive, traffic engineering, metal processing – as an expert, Mathias P. travels the world with automation solutions by and for Pilz. He often talks to his wife about his experiences...

- **Mat, it's simply idyllic here on Langkawi:** long beaches, green jungle, mangrove forests, mountains, waterfalls – a real natural paradise. It's so great that we spend our holidays here.
- Yes, and tomorrow we will visit the summit of Gunung Mat Cincang, where there is a great view of the surrounding islands. By the way, we will take the Sky Bridge to get there.
- **Sky Bridge? That sounds very impressive.**
- It is. It's a 125-metre-long bridge that opened in 2005. It's one of the longest curved pedestrian bridges in the world. It is suspended about 100 metres above a gorge and is supported by a single pole that is 82 metres tall. And the best thing about it is that our safe small control unit PNOZmulti ensures that we will get to the Sky Bridge safely.
- **Safe automation in a natural paradise? How does that fit together?**
- An outdoor lift from our customer, L-Tec, connects the Langkawi cable car summit station with the phenomenal panoramic bridge. A set of Pilz safety components is used in the cab, ranging from emergency stop pushbuttons to door, position, standstill and end position monitoring systems to operating mode switchover monitoring systems. The versatile PNOZmulti safe small control unit, which has been tested all over the world, is responsible for central safety management.
- **I see what you're getting at: People need safety systems not only on the factory floor, but also in the most beautiful places in the world.**

► Panorama Interview with Dipl.-Ing. Berthold Heinke, Wood and Metal Trade Association

## Automation, flexibility, and innovation – what must be considered?

The networking of individual machines and complete production lines forms the basis of the flexibility Industrie 4.0 requires. This means that even products that are still in the early stages of technical development, but will soon find their way into the production process, must be taken into account.

Dipl.-Ing. Berthold Heinke, Wood and Metal Trade Association, head of the HSM testing and certification body, explains what needs to be considered:



► **Mr Heinke, is everything that can be implemented from a technical perspective safe enough?**

The introduction and acceptance of new products must not lead to a reduction in their safety levels. Even now, the concept of safety must no longer refer exclusively to safety itself, but must also include, and with equal weight, IT security.

► **What does that mean?**

The methods for assessing safety have already changed and must continue to be adapted to the development of new products. Insufficient tools for assessing safety must not create an impediment to fast innovation.

► **What should be the main objective?**

Ensuring that safeguard breakdown or failure does not cause dangerous conditions remains the main

objective. Continuous development of procedures and tools for assessing the necessary safety level must be the common goal of designers, developers, and safety engineers. This is the only way to ensure that innovations can be implemented and accepted in the field of machinery safety.

## EtherNet/IP/CIP safety head module for the PSSuniversal 2 remote I/O system



The new head module with EtherNet/IP/CIP safety interface expands the PSSuniversal 2 remote I/O system so that it can be adapted to other system environments by simply exchanging the head module. PSSuniversal is the economical solution for I/O peripherals. A remote I/O, it is connected to the higher-level controller and connects the field level with the control level. The I/O modules can be used universally in an

identical manner for the various safety protocols. Its three-part system structure means that the PSS u2 system is easy to install and service. The operation sequence is intuitive. Its simple handling helps the user to avoid errors and save time.

Webcode:  
web150509

Online information  
at [www.pilz.com](http://www.pilz.com)

## PSS67 PLC: Automation outside the control cabinet



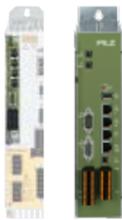
PSS67 PLC is the first safe PLC control unit with Protection Type IP67. It is suitable for industrial automation outside the control cabinet. Mechanically this controller is especially robust due to its fully encapsulated module electronics. PSS67 PLC can be mounted directly on the machine and requires little space. This means far less wiring work than that required for control-cabinet-based systems and increases flexibility when modular system architectures are implemented.

As part of the PSS 4000 automation system, PSS67 PLC can be used as a fully-fledged PLC controller for automation and fail-safe tasks. The entire configuration of the device can be stored on a protected MicroSD card. This facilitates device replacement, a procedure that requires only the reinsertion of the MicroSD card.

Webcode:  
web188261

Online information  
at [www.pilz.com](http://www.pilz.com)

## PMCprimo: Now with EtherCAT Master and a new programming environment



The motion control system PMCprimo MC and the motion control card PMCprimo C for plugging into the servo amplifier PMCprotego D now also communicate as masters via the real-time Ethernet EtherCAT. PMCprimo naturally also supports master and slave communication interfaces such as Modbus/TCP, CAN, or PROFIBUS-DP-S and offers a flexible solution for a wide range of application areas, thanks in part to a large number of on-board I/O interfaces and three encoder inputs. The

latest version, Version 3.5, of the PLC programming environment is now available to users. This allows users to benefit from all the advantages of object-oriented programming. Thanks to the integrated real-time task with a processing time of 1 ms, high-performance applications such as path interpolations can also be implemented.

Webcode:  
web150507

Online information  
at [www.pilz.com](http://www.pilz.com)

## SafetyEYE safe 3D camera system: More comfort and performance



The safe 3D camera system SafetyEYE allows workspaces to be monitored optically – without impeding access to the application. Installed above the application, it continuously monitors the entire application area. The latest generation now has a convenient live video server. This allows live images and space violations to be displayed remotely without requiring access to the Configurator's programming environment.

The PSSuniversal PLC controller from the PSS 4000 automation system

is now used as the controller. This means that several analysis units can now be operated from one control unit. The assignment of protected areas to the inputs and outputs of the pre-configured control unit reduces programming effort. A corresponding software component for SafetyEYE is available in the PAS4000 software platform library.

Webcode:  
web150416

Online information  
at [www.pilz.com](http://www.pilz.com)

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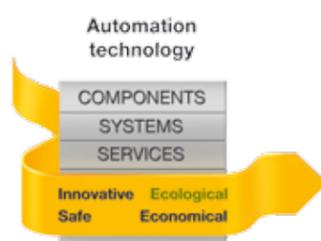
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