MENSCH und AUTOMATION

PILZ
THE SPIRIT OF SAFETY

Première for Pilz service robotics

Curtain up for Pilz: Pilz is giving its service robotics modules their first public showing at Automatica 2018 (June 19 to 22, 2018) in Munich.
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Safe cut

Safety gate system PSENmlock provides a one-stop solution for safe gate locking and safe interlocking at the mechanical engineering company Brodbeck.
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Software creating opportunities

Pilz is investing in the development of software solutions. At its Cork location in Ireland, Pilz has added a new building to its software development centre.
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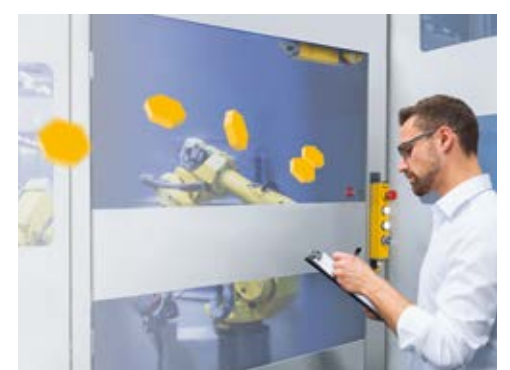
Gateway to the factory of the future

Sensor technology is acquiring an increasingly important role in automation. Modular and intelligent, solutions for such installations as safety gates can be scaled flexibly and allow rapid diagnostics in the event of a fault.

To ensure functional safety, systems need to stop as soon as a safety gate to a hazardous zone is opened. An optimum safeguarding approach can be customised to the often differing requirements encountered in packaging and tooling machines, the food and automotive industries or in special-purpose engineering. For that reason, Pilz provides full modularity for the secure safety gate systems PSENslock and PSENmlock. The non-contact safety gate systems PSENslock combine secure safety gate monitoring with a non-contact magnetic interlock in just one unit. The safety gate system

PSENmlock offers a safe interlock and safe guard locking device in a single product.

Depending on the application, the user selects the appropriate safety gate sensor and combines this with additional components to create their individual solution. With PSENmlock, they can choose between a base version and a version for series connection, which can be used with additional components. An escape release is available as an optional accessory in two versions: the classic escape release and the remote escape release. The latter enables the design engineer to keep the safety gate

switch and escape release physically separate. Suitable handles for swing and sliding gates complete the range of individual solutions.

Both PSENmlock (for safe interlocking and guard locking) and PSENslock (for safe position monitoring) can also be combined with the pushbutton unit PITgatebox. With the separate control and pushbutton elements, the user achieves a simple operating function combined with a high degree of quality and design. The status of these safety gates is detected by safety sensors that are often connected in series according to a standardised approach:

OSSD (Output Switching Signalling Device) outputs of one sensor are connected to inputs of the following sensor. Previously, they all needed to be wired individually in a star configuration to establish which sensor has been activated. That was expensive and laborious.

Editorial

Dear Readers,

To keep systems running safely, industrial production applies the principle of separating the function of a machine (target function) from the safety function (guarding function). The requirements placed on this static safety architecture can be identified very clearly from the Machinery Directive and standards. Digitalisation allows networking in real time, as well as digital twinning of machinery and robots. That also places growing demands on the adaptability of production plants. The communication features of Industrie 4.0 components in conjunction with the Industrie 4.0 administration shell are becoming the prerequisite for new functionalities and rapid adaptability of future production systems. A swarm of intelligent Industrie 4.0 components calls for a dynamic safety architecture to be defined. Industrie 4.0 products are characterised by features that contain technical safety profiles. The target function is inseparably linked to the necessary features that guarantee all safety aims in a dynamically configurable production plant. The potential efficiency gain from intelligent networking can only be realised on a broader scale if we come up with comprehensive solutions. In Smart Factory KL, we are working with industry partners specifically to integrate mobile robots and AGVs dynamically into the appropriate safety chain with the help of Industrie 4.0 functionality. The human operator still has to remain in control of all autonomous Industrie 4.0 components, robots and AGVs.
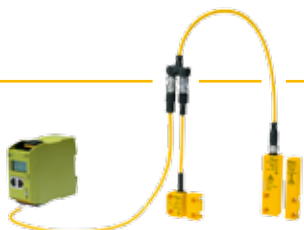
Best regards,

Dr. Detlev Richter, Global Head of Industrial and Energy Products, TÜV SÜD Product Service GmbH

With the help of an intelligent diagnostic solution such as Safety Device Diagnostics (SDD) from Pilz, status information for safety devices can be accessed, their configuration parameters read out and actions visualised. Because the diagnostic information in this case can run to up to 300 bytes – compared with 1 bit previously – it is possible to realise functions that until now were the preserve of highly complex sensors and programmable logic controllers.

Status monitoring locally and over the Internet
Thanks to SDD, the control and diagnostic data for the safety gate system PSENmlock can be accessed and processed via Modbus/TCP or PROFIBUS-DP, and in future also via PROFINET EtherNet/IP. It is then presented neatly on the local display of the SDD fieldbus module, the monitor of a PLC or remotely – via web server – on

process in the event of a fault. This information is also helpful for swiftly locating a defective safety sensor in complex facilities. In addition, warning lights in a control cabinet can be energised directly if a safety sensor has opened a safety gate.
Because a wide range of diagnostic data can be accessed locally or remotely with the diagnostic solution, it is also suitable for predictive maintenance. With the help of the data stored in the diagnostic solution, users can compare the original status with the current one at the click of a mouse – without the additional hardware that is otherwise needed at control level.

Guard locking can now be performed individually
In conjunction with the secure safety gate system PSENmlock, it is now also possible to energise safety gates individually with the

With the modular safety gate system, Pilz enables a flexible combination of individual components to suit each specific set of requirements. Users benefit from an economical series connection, rapid diagnostics, additional control and pushbutton elements and an optional escape release.

a computer screen. The diagnostic solution is configured for connection of up to sixteen safety sensors, with the architecture of the safety circuits of no relevance. All sensors can be managed centrally from a mastergate in the diagnostic system, making it significantly easier to monitor several safety devices.

Single-cable solution for even the biggest of applications
Which diagnostic information can now be recorded? First of all the status of the safety sensors and other device data, but also the last status changes or past error states.
It is also possible to read out overvoltage or undervoltage warnings that may occur especially with long cables if they have not been carefully dimensioned first. Because unlike other systems, the innovative diagnostic solution can extend for up to 900 metres, enabling it for the first time to connect up e.g. large high-bay warehouses, intralogistics applications or spread-out facilities in the steel industry by a single-cable solution.
The scope for storing device properties such as the article and serial numbers, the product version number or equipment identification markings also facilitates the replacement

diagnostic solution despite the extensive single-cable solution. If any maintenance work or a tool change is needed in a facility, users can define which gates may be opened after shutdown. Without the use of Safety Device Diagnostics, all safety gates connected in series would open at once when the unlock function is requested! This ensures that only suitably trained and authorised personnel can access the plant – and prevents manipulation attempts locally. The ingenious single-cable solution also pushes back the boundaries of series connection: it makes it easy for the mechanical engineer to add another module. Thanks to the innovative implementation of series connection and ease of use of the sensor data, SDD is also an optimal solution for the factory of the future.   ◀

Safety Device Diagnostics – smart all-in solution

The diagnostic solution Safety Device Diagnostics (SDD) from Pilz combines with the manufacturer's controllers – including the classic safety relay PNOZ, configurable safety controllers PNOZmulti and the automation system PSS 4000 – to create an all-in solution. SDD consists of a fieldbus module plus a distributor and safe sensor technology. This is a gateway to implementing a wide range of applications for safe automation. Currently, secure safety gate systems such as PSENmlock from Pilz can also be connected to SDD. SDD covers both functional safety and classic automation requirements.

"We automate. Safely."

For Pilz, the main feature of this year's Hannover Messe was innovative automation solutions that will make the vision of the factory of the future a reality.

The main attractions were the new offerings for modular safety gate systems. On its exhibition stand, Pilz presented the individual components of the new modular safety gate system with the help of a model, accompanied by the motto "Your gate. Our system. Your safety." and demonstrated to visitors how they can combine them to obtain their custom-made safety gate solution. Users benefit from an economical series connection, more rapid diagnostics, additional control and pushbutton elements and an optional escape release.

Dynamic sensor technology for monitoring areas and spaces

With area guarding of plant and machinery it is essential to reconcile safety, user-friendliness and productivity. From area and space monitoring to quality control, all the way up to safeguarding of HRC applications, various models demonstrated to visitors how such applications can be put into practice using new dynamic sensors from Pilz. The pressure-sensitive safety mat PSENmat offers monitoring and control function through virtual switches in just one device. Pilz showcased the new safety laser scanner PSENscan for productive area monitoring, including for applications in series connection. And for safe monitoring of space, the safe 3D camera system SafetyEYE offers unique functionalities.

Standard-compliant human-robot collaboration (HRC) requires no fences

Visitors to the exhibition were able to test for themselves what limit values for pressure and force apply to a collision between a human and a robot. For this, Pilz presented the HRC Collision Measurement Set, which can perform validation of applications to comply with ISO/TS 15066. Visitors to the stand could witness how humans and robots work hand in hand and were presented with a sweet treat by the "robot colleague". ◀

Webcode: web180702

Online information at www.pilz.com

Première for Pilz service robotics

Curtain up for Pilz: at Automatica 2018 (June 19 to 22, 2018) in Munich, Pilz is giving its service robotics modules their first public showing in Hall B4, Stand 500.

The spotlight is on the robot arm PSIR developed in-house by Pilz. It is especially suitable for pick-and-place applications and modular semi-automated robot cells. The manipulator is complemented by additional modules for service robotics, such as the handset for easy setup and teaching of the arm, and the control cabinet with the control functions governing safety and the arm's movements.
The Pilz robotics modules create an overall solution by bringing together technologies from various Pilz product families such as safe drive technology, safe sensors and motion control.
Visitors will be able to witness the modules in action on the Pilz stand, and interact with the robot systems: upon request, a dual-arm robot from Pilz wraps a gift that another robot transfers from an automated guided vehicle to a manual work station, where it is handed safely to the visitor. For the protection of humans and machine, various sensor technology solutions from Pilz are used, such as the safety laser scanner PSENscan and the dynamic pressure-sensitive safety mat PSENmat. PSENmat in particular combines individual operating concepts and safe area monitoring of human-robot workstations. Also on show in Munich: the safe 3D camera system SafetyEYE. Guard-free workspaces, which are shared by human and machine, can now be monitored safely.
At Automatica, the new modules from Pilz will be on show not just on Pilz's own stand, but also on the stands of the Fraunhofer Institute IPA, the Wood and Metal Employer's Liability Insurance Association, the gripper technology specialist Schunk and the Ruhr University of Bochum.
To round off its presence at the show, Pilz will be presenting its range of services for human-robot collaboration (HRC). Each robot application must be considered individually in terms of safety. Pilz provides support with a range of services tailored to the individual life phases of a robot system: from application analysis to risk assessment in accordance with EN ISO 12100, through to CE marking. Pilz safety solutions meet the standards of DIN EN ISO 10218-2 and ISO/TS 15066.
The training package on the topic of robot safety completes the range of services. ◀

As a system supplier of service robotics, Pilz will be able to support users with the implementation of complete robot applications in the future – including the necessary safety technology such as safety gate systems or safe sensor technology for monitoring areas and spaces, as well as the services required for achieving CE marking.

Webcode: web195174

Online information at www.pilz.com

In brief ...

**PNOZsigma Configurator:
Quick and easy**

With the PNOZsigma Configurator it is possible to individually configure the PNOZ s30 speed monitor quickly and easily using a PC. Compared to the current configuration via push + turn on the device, using the PNOZsigma Configurator improves user friendliness considerably and ultimately saves time.
Configuration is possible for all device versions from V2.2 to the newest version V3.0. New configurations can be created and stored, and existing ones read, copied and edited.

The configurations can either be written onto a SIM card using the PNOZ Chip Card Reader or transferred directly to the device with a special USB cable.

High safety and maximum robustness

Sensors encapsulated in stainless steel are suitable for use in harsh industrial environments, such as the food industry, pharmaceutical production and cosmetics manufacturing.

On the one hand they offer minimal scope for deposits to form, and on the other hand they are resistant to aggressive cleaning methods such as sterilising with hot steam, and therefore easy to clean. Because stainless steel displays neutral behaviour to food, stainless steel sensors readily satisfy hygiene requirements.

For such harsh environments, the non-contact, magnetic safety switches PSENmag are now also available with stainless steel housings. That makes them particularly robust for safety gate and position monitoring. Thanks to protection type IP67/IP69K, the benefits of PSENmag stainless steel sensors extend beyond heavy contamination loads and cases where rigorous cleaning is required. They are also heat and cold-resistant for temperature ranges from -25 to 80 °C, and the connector version can even be used up to 120 °C.

The new stainless steel version is also noted for its vibration and shock resistance. The high B10d value, a performance indicator that expresses the probability of dangerous failures, underscores its durability.

The non-contact, magnetic safety switches are used to monitor the position of guards such as safety gates in accordance with EN 60947-5-3 and also for general position monitoring.

In conjunction with the configurable safety controllers PNOZmulti or safety relays PNOZsigma, it provides users with a safe and economical all-in solution. ◄

Webcode:
web150413

Online information
at www.pilz.com

Grey for theory, yellow for safety

All theory is grey – Goethe had already concluded that. On the other hand safety on the factory floor sports the colour yellow, and calls for various practical skills as well as a degree of basic knowledge. Pilz has therefore developed the modular training systems PES. Pilz not only uses PES for its own training and advancement; it also offers the system to companies as well as educational and research bodies.

Modular training systems such as the Pilz Education Systems PES improve practical training in the field of automation technology. In total, there are nine different control panels that can be combined with one another from the sensor technology, control, operation and maintenance sectors as well a board that simulates a real plant. Thanks to the use of genuine industrial components, the safety and automation functions of a plant or machinery can be realistically simulated.

At Pilz itself, apprentices use these systems in their second year of training to learn the practical basics of safe automation. With the help of wiring examples, they then execute their own projects and solve tasks based on predefined sample exercises.
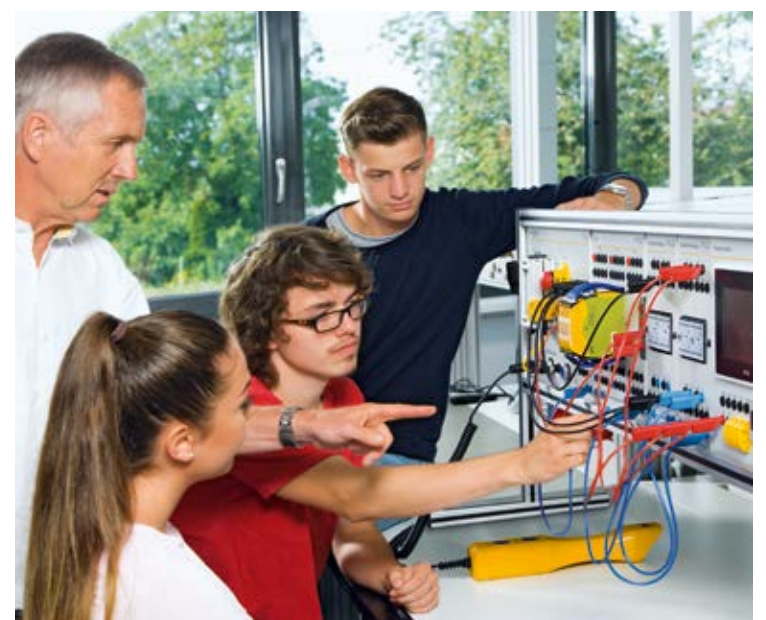The level of difficulty can be varied: by way of an easy entry point the trainer can for example use the training systems with the key sensor technology functions and relays. That enables them to explain the basics of machinery safety engagingly without any programming knowledge being necessary.
As the tuition progresses, modules with more complex controllers are then used (for instance, a panel on the subject of logic where students can learn how to compile more complex safety circuits with fixed or free configurations). The "conveyor belt actuator technology" control panel offers maximum focus on practicality because it represents a complete machine and its safety and automation functions. The aim is for students to be able to commission the system using a variety of programming languages so that the workpiece on the conveyor belt is set in motion and the appropriate safety functions are triggered as necessary.

"We like using PES so much as part of our in-house teaching because the modules of the training system can be used straight away and combined in different ways without any further installation work," reports Pilz Head of Training David Ballau. "It's obviously much more interesting for our apprentices to practice with such realistic applications and then be able to use the knowledge they have acquired on real machinery."
PES are also used in areas other than training at Pilz, for example at universities (in the teaching of such subjects as electrical engineering and automation). The documentation supplied is presented in such a way that the exercises can also be completed by self-study, without instruction. ◄

Safe cut

Wherever drives cause movement in machines and heavy rollers and blades are rotating, there are multiple hazards that must be guarded against.

The Swabian machine manufacturer Brodbeck, which has been using automation systems from Pilz for many years, uses the safety gate system PSENmlock and the coded safety switch PSENcode in conjunction with the configurable safety controller PNOZmulti 2 as a universal solution for virtually all machine models. With its standard and special machinery for winding, finishing or dividing sleeves made of paper, card or plastic, the medium-sized family firm is regarded internationally as a technology leader and enjoys an excellent reputation in the industry thanks to its out-and-out emphasis on quality and service.

The safety gate system PSENmlock from Pilz combines two functions: safe guard locking and safe interlocking in a single device – especially for machinery with dangerous overrun (such as rotating spindles, blades).

The aim: complete redesign plus safety

The UNI 75 is a universal mandrel machine measuring about four by two metres, and two and a half metres high. "This machine will allow our customers to cut sleeves with outside diameters of between 70 and 750 millimetres without burrs using the same mandrel – no changing tools. It is fast, flexible and suited best to small and medium batch sizes," explains Siegfried Maier, design manager at Brodbeck.

The aim was to completely redesign the UNI 75 machine to bring it right up to date with the state of the art, with everything that entailed, including modern control, parameter setup and visualisation solutions. Where axles rotate and cutting tools are in action, there is always the question of safety. Because with some of the Brodbeck machines, people have to intervene in the process during feeding and discharging of material. The latest technology was therefore required for safe guard locking of four safety gates. According to the risk assessment, it must not be possible to deliberately or accidentally open the safety gates during operation. From the risk assessment or determining the performance level to the final CE marking, there are lots of things that must be considered. Siegfried Maier explains: "No small to medium-sized company can do this alone and we are happy to rely on the competence and expertise of a qualified partner such as Pilz."

Safety gate system for all mounting positions

With Brodbeck's standard and special machines, the gate lock mounting position can vary considerably. The PSENmlock safety gate system has the advantage that the LEDs are mounted on three sides and are therefore easy to read for diagnostic purposes. A flexibly mounted actuator also provides high tolerance compensation in case a gate should sag. Technically, safe guard locking is performed via a dual-channel control. The system is particularly suitable for machines with dangerous overrun (rotating spindles, blades, etc.) which make safe guard locking mandatory.

The advantages of joined-up safe sensor technology

The position of the rolling door is monitored by the coded safety switch PSENcode from Pilz. It is used both for monitoring the positions of safeguards in accordance with EN 60947-5-3 and for simple position monitoring. This allows PSENcode to guarantee maximum protection against manipulation even in the smallest of spaces, depending on design (key-lock principle). The configurable safety controller PNOZmulti 2 with the corresponding modules is used as the central unit for monitoring safe signals in UNI 75. "In PNOZmulti 2 all the functions required for our machine are set up. Up to now, we have had very good experiences with the demand-oriented approach and flexibility in project configuration. That's why the flexible controller is also installed in almost all our machines," says Brodbeck designer Frank Stiefel.

Brodbeck values quality and reliable customer service. "We tested the safety gate system PSENmlock in a pilot application. It won us over not only because it offers safe interlocking and guard locking in one device. The outstanding installation and diagnostic features are particularly convenient and we will be using the gate locking system on all our machines in the future," says Frank Stiefel. "Because our customers are not looking for machines – they want convincing solutions including competent advice and reliable service." ◀

PSENslock   PSENmlock   PSENsgate

Pilz offers safety gate systems for safeguards which, in accordance with EN ISO 14119, prevent shutdown and restart (interlocking) as well as manipulation or bypassing.

The safety gate system PSENmlock from Pilz is easy to apply and uses convenient diagnostic LEDs that are always visible to ensure a safe view of processes in any mounting position.

Three minutes with ...

... Stefanie Kussmann

Advanced Technical Support

▶ **Ms Kussmann, what are you currently working on?**

Now that it's spring, the exhibitions are important events. The responsibilities of my team include exhibiting our products in action at shows in Germany and internationally. We deal with designing, setting up, programming and commissioning exhibits and demonstrators. For Hannover Messe, for example, we extended the application that visualises the advantages of our dynamic pressure-sensitive safety mat compared with the solutions previously in use. At the moment we're preparing for Automatica in June, where we'll need several new models to demonstrate what our new products for robotics are capable of.

▶ **What does "Advanced Technical Support" actually mean?**

Looking after exhibits at shows is only one aspect of our work. My colleagues and I mainly support customers and our subsidiaries for all more advanced issues, especially for commissioning plant featuring our products. That also includes advising customers in advance and carrying out on-site feasibility studies, for instance for our safe 3D camera system SafetyEYE.

▶ **And that helps you glean valuable practical information that is fed back into the company.**

Correct. The market launch teams have an important role to play at Pilz in making new products a success. Alongside Product Management, Marketing and Sales, Advanced Technical Support is part of the team and makes sure the user perspective is taken into account – by always asking the question: "What would the customer think?"

▶ **So which holds the greater appeal for you: exhibits for shows or applications in the field?**

There are obviously a lot of parallels in project

planning. At exhibitions, we're generally dealing with brand new products where we don't have much experience with their installation. That can sometimes be tricky. Ultimately, the same principle applies in both areas: it has to work!

Software creating opportunities

Pilz is investing in the development of software solutions. At its Cork location in Ireland, Pilz is adding a new building to its software development centre. That is where it creates software solutions for control and visualisation of machinery. The area of focus involves networking and cloud-based services.

In the presence of the Irish Foreign Secretary and deputy Prime Minister Simon Coveney, Susanne Kunschert and Thomas Pilz joined John McAuliffe, Managing Director of Pilz Ireland, for the opening of the new "Renate Pilz Development Centre".

"Software is a crucial part of all our products and services. Here in Cork, Pilz develops software for products and infrastructures that support customers throughout the entire life cycle of their plant. Along with the spread of digitalisation in industry, there is rapid growth in opportunities from software applications in the cloud and on our devices," remarked Thomas Pilz, underlining the importance of the work being done in Cork. "We are technology leaders in automation, and intend to stay so. The new building for our new Software Development Centre makes that emphatically clear," he added.

The Internet of Things in focus

The investment outlay of EUR 4.7 million in the infrastructure at Cork enables Pilz to expand its software portfolio for automation solutions and develop new technologies for the Internet of Things (IoT), data analysis and software-

as-a-service (SaaS). The new building with 2,500 square metres of floor space will house up to 125 developers. Pilz is therefore transforming its existing branch in Ireland into a campus that places a big emphasis on networking and cooperation. Pilz is looking to a modern infrastructure and buildings management solutions to create an open, agreeable working environment.

20 years of software development in Cork

Former President Renate Pilz had established the software development centre in 1998. An international team of developers in Cork designs and creates software for planning, programming and visualising control systems. Right from the outset, the development team in Cork has delivered innovative and often trailblazing software solutions, including the multiple award-winning PNOZmulti Configurator.

Particular importance of Cork location for Pilz Group

The campus in Cork is home to other corporate areas of the Pilz Group alongside software development: From its base in Ireland, Pilz Global Account Management looks after inter-

From left: Susan O'Connell, Vice President of Software Development, Pilz GmbH & Co KG; Thomas Pilz, Managing Partner Pilz GmbH & Co KG; Renate Pilz, Retired President, Pilz GmbH & Co KG; Simon Coveney, Thánaiste and Irish Minister for Foreign Affairs; Susanne Kunschert, Managing Partner Pilz GmbH & Co KG; John McAuliffe, Managing Director, Pilz Ireland; Martin Shanahan, CEO of IDA Ireland

national key accounts and the International Service Group (ISG) enables Pilz to handle service projects consistently and to the same standard of quality on a worldwide scale.

Pilz Ireland Industrial Automation in addition serves its customers in Ireland through a dedicated sales organisation, along with the "Automation Safety Engineering" division. ◂

A wealth of experience to draw on

Pilz Austria is the oldest subsidiary in the Pilz Group, and throughout its history has successfully introduced all Pilz technology milestones to the Austrian market.

From its beginnings in Vienna in 1969, operating from a small apartment with its garage serving as the product warehouse, in 2018 the subsidiary has now evolved into a setup with three separate branches: As well as the company headquarters in the capital, there are the Linz office, which oversees sales activities throughout western Austria, and the Graz office covering the south of the country.

The 1970s were all about the first electronic timer relays; the sales portfolio also included electronic plug-in cards for industrial control systems. There are still customers of the first hour – such as Austria's oldest industrial furnace manufacturer – who are well familiar with these products. The introduction of the first safety relay PNOZ in 1987 was also a memorable occasion. "Such a novel product for the time was a steep learning curve: it was truly a pioneering task to put across the benefits of PNOZ to the Austrian market," recalls Walter Eichner, now Managing Director of the Austrian subsidiary.

Pilz Austria started out with two employees; there are now separate departments to take care of the sectors, services and the various product areas; yet another department is dedicated exclusively to sales.

As a provider of systems and solutions for the automation of machinery and plant, Pilz Austria offers more than merely products: customers receive a comprehensive service, intensive training and, if required, the team can also provide support for the configuration, planning and implementation of safety-related tasks.

Pilz Austria also operates beyond the country's borders, serving Slovenia, Croatia and customers in South Tyrol via local sales partners. The mechanical and plant engineering sector is the main target industry. Appropriately for the country, the cable car sector is also significant. Amusement rides, too, are an important target sector – anyone who visits the Prater can ride in the safe knowledge that Pilz is also on board.

Customer projects are not the only area where Pilz Austria is noted for its performance: there is the (sporting) highlight of the annual "Business Run". This event takes place in Vienna. Over and above embracing the Olympic principle of "taking part is what matters", our colleagues in Austria have actually been notably successful with their pace and stamina. The annual Pilz football tournament has become something of a tradition, too. As well as Pilz teams from various countries, Pilz customer teams also take part. A friendly event that is all about enjoyment and a shared experience. ◂

Connecting worlds

Industrie 4.0 brings different worlds into contact with each other: the virtual world of 1s and 0s, and the real world of production. The idea of the administration shell is intended to enable communication between both worlds.

On the Industrie 4.0 platform set up by the German government, companies such as Pilz, federations, trade unions and representatives of the worlds of science and politics work on the production of the future in umbrella projects. The aim is to create a common basis for standardised, reliable framework conditions.

For automation businesses such as Pilz, this means providing the necessary components and systems, but also services, within their innovation flow. Whereas Industrie 3.0 had more than 30 years to develop incrementally and establish standards, the challenge with Industrie 4.0 is to handle this very compactly, across companies, industries and applications.

The Reference Architectural Model Industrie 4.0 drawn up on the platform, or RAMI 4.0 for short, provides such a basis. It brings together the essential elements in a three-dimensional layer model. The various different Industrie 4.0 components can be located within RAMI 4.0 and can interact with each other thanks to what is know as an administration shell.

Reference Architectural Model Industrie 4.0 (RAMI 4.0)
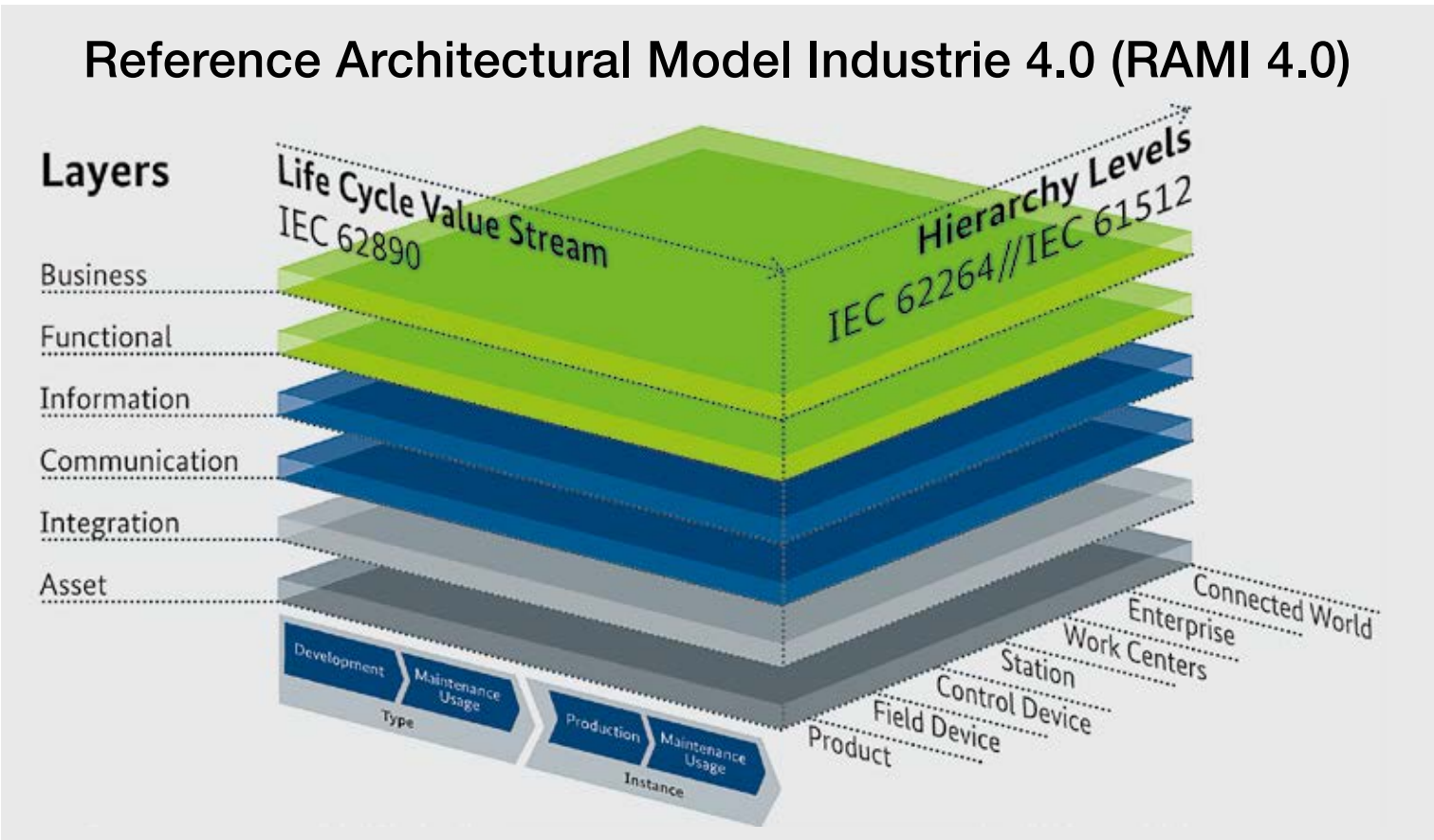
Apropos ...

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. travels the world with automation solutions by and for Pilz. He often talks to his wife about his experiences...

▶ Mat, you know, our trip to Asia was really nice, but I wouldn't mind just nipping over to Belgium sometime. Maybe to the Ardennes, what do you think?

That's a nice idea, love. We could even take in the Formula 1 live. It's happening in August, and you like fast cars, don't you?

▶ Formula 1? Yes, great. You really need to see those racing cars in action. So fast.

Aren't they just. Like all sports cars. It all comes down to their brilliant technology: the engines, the drives – everything. Building them is quite an involved business: you need a specially adjusted test rig geared to every model, for example its power units; bog standard won't do.

▶ That sounds exciting!

Yes, it is. Tremec in Belgium, a customer I visited recently, builds power units for the sports car industry, for instance. It's difficult, not to say impossible, to use a standard test rig; you simply don't get the batch sizes, it's such a niche product. Standard test rigs can't produce the dynamics, performance and speed.

▶ So do they make their own test rigs?

Yes. The controller's first feeling sets the tone. All the features of a sports car need to come across undiluted. That's where Pilz comes in: because the test rigs have to meet exceptionally high standards of dynamics and speed, our automation system PSS 4000 monitors the speed of the test rigs that simulate the cars' wheels and power units.

The fundamental idea of the administration shell: every object in Industrie 4.0 is given a digital twin. It describes for instance a drill in the virtual world, assigns the drill a unique ID and receives information on what the drill can do. Using the administration shell, it is possible to integrate any objects into the world of Industrie 4.0 using information technology.

An administration shell contains various different submodels or layers, such as "Secure Identity", "Safety" and also "Security", each of which is described by various features. They are based on standards and norms that are already active and in use.

Elaboration of these ideas and models is in full swing. They are the subject of a close dialogue between the participating federations and industry. For example, the VDMA has about ten working groups dealing with definitions for machinery, e.g. for the food and packaging industry. The ZVEI has already produced an initial draft for the area of drive technology that consequently provides a basis for further components such as the sensors.
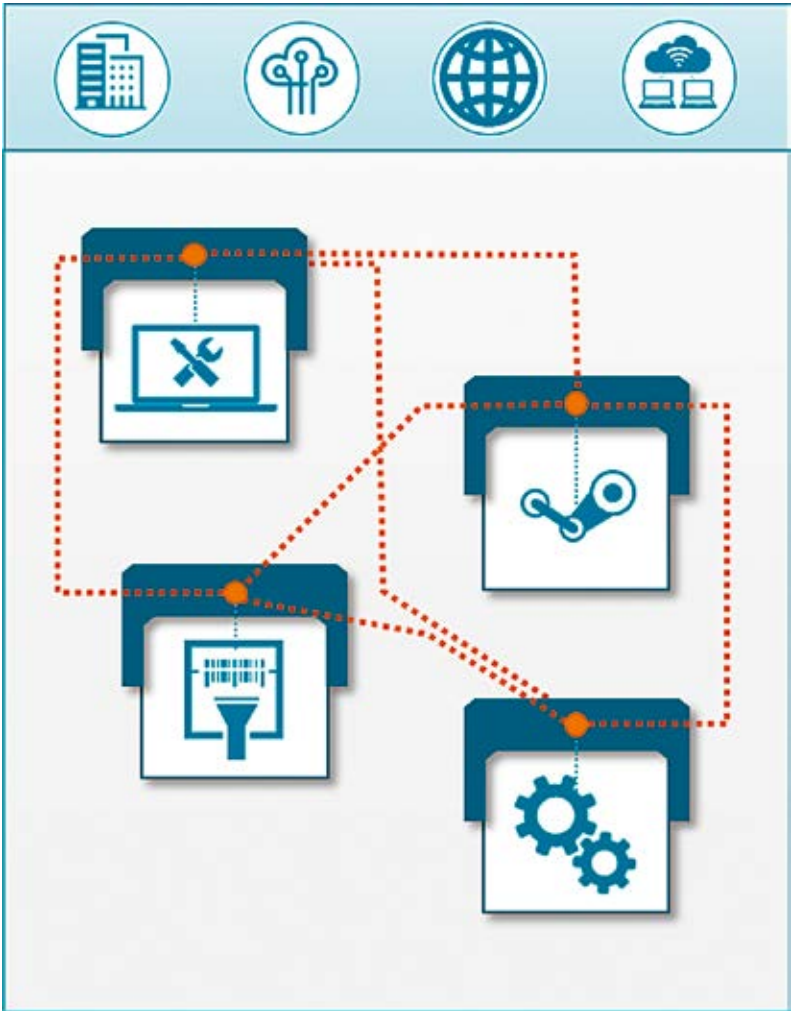
The administration shell is the interface between Industrie 4.0 communication and the physical object, and also serves as data memory for all information about the asset. As a standardised communication interface in the network, it can also integrate passive assets.

Illustration: © Anna Salari

These digital descriptions form the basis for Industrie 4.0 communication, for the tools, and also for new business models. Pilz and its partners in the working groups are therefore currently investigating sophisticated issues – that are both important and fascinating – regarding the functioning of Industrie 4.0. ◀

Reliably gauging temperature, filling level etc.

The analogue input module PNOZ expands the product family of configurable safety controllers PNOZmulti 2. It makes it possible to capture and monitor any processes such as pressure, temperature, filling level or rope speed and load safely up to PL e or SIL CL 3. The matching blocks for limit value, range or working area monitoring can easily be parameterised via the software module PNOZmulti Configurator with just a few mouse-clicks. Arithmetical functions such as mean calculation, differential pressure calculation etc. now for the first time also facilitate use, for example, and allow better diagnostics. In combination with the visualisation software PASvisu from Pilz, downtimes can be minimised. Its users moreover benefit from rapid commissioning and reduced wiring. As well as its diverse range of applications, using the new analogue module brings advantages especially for the process engineering and cable car/lift construction sectors.

Webcode:
web150500

Online information
at www.pilz.com

Economical diagnostics and visualisation

Pilz brings two new entry-level diagnostic and visualisation panels onto the market in the shape of PMIvisu v704e and v707e. They combine economy and performance, for example thanks to up-to-date processors and the Linux operating system. The capacitive glass displays are available in sizes of 4.3" and 7". The PMI Manager is available for simple panel commissioning and management. It permits coordinated, preconfigured HMI functions for efficient project planning.

PMIvisu is a pre-installed, licensed solution package consisting of the operator terminal PMI with its pre-installed visualisation software PASvisu. PASvisu is already licensed with 150 external variables on the new devices PMIvisu v7e.
The PMIvisu panels are compatible with the safety controller PNOZmulti. This allows professional visualisation of plants and machinery – at a single glance!

Webcode:
web160789

Online information
at www.pilz.com

# Safe monitoring of mechanical presses

Among the safety controllers PNOZmulti 2, there is the new dual-pole semiconductor output module PNOZ for safe, simple monitoring of mechanical presses. Depending on the application, PL e in accordance with EN ISO 13849-1 and SIL CL 3 in accordance with EN IEC 62061 are achieved. Two safety outputs in semiconductor technology serve the actuation of press safety valves or other actuators that require dual-pole switching. The eight inputs can be configured with an individual filter time to enable correct operation with a variety of input signals. Certified press blocks in the software tool PNOZmulti Configurator, e.g. for operating modes or monitoring functions, render use easy and economical. One particular advantage is the scope for configuring a separate module program (mIQ) with specific settings, and then executing it locally on the module with much shorter cycle times. That enables very short reaction times of < 8 ms.

Webcode:
web150500

Online information
at www.pilz.com

Simple operation of safety gate systems
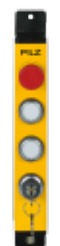
Simple operation meets premium quality and design: with the pushbutton unit PITgatebox, safety gate switches and systems can be controlled easily and flexibly. Machine operators can give commands such as activate, stop or reset a machine or plant directly at the operating unit. The sturdy operating unit with protection type IP65 and a zinc die cast housing affords high protection against environmental factors such as shock, vibration and collision. Thanks to the slim design, pivoting end caps and an M12 connection, PITgatebox is quick and easy to fit to conventional profile systems. Each preconfigured version with various combinations of pushbuttons, key switches and E-STOP pushbuttons gives design engineers maximum flexibility for their individual application. The PITgatebox represents a modular safety gate solution tailored to individual needs, especially when combined with the secure safety gate systems PSENmlock and PSENslock.

Webcode:
web194459

Online information
at www.pilz.com

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