

Background information

Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern
Deutschland/Germany
www.pilz.com

Industry 4.0: Pilz helping to shape the future of automation

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Safe and smart: En route to integrated production

Ostfildern, November 2017 – **Industry 4.0 aims to secure competitiveness in industry through the use of Internet technologies in production processes, enabling more flexible and efficient production environments. The interaction between safety and security and the distribution of control intelligence are major factors for the success of Industry 4.0.**

The terms Industry 4.0, Internet of Things or SmartFactory describe the increasing trend for networking plant and machinery. Information technology and automation are closely interlinked, meaning that in future, a highly networked industry can increase the company's added value whilst simultaneously reducing costs.

As companies develop their automation landscape to embody industry 4.0, new safety challenges are emerging: The desired production systems are highly networked structures involving a variety of people, IT systems, automatic components and machines. There is a lively and often time-critical exchange of data and information between the technical system components, which act autonomously in some cases, while at the same time considerably more actors are involved across the added value chain.

Safety as a factor that is critical to success

Two worlds collide here with regard to the topic of safety: The world of automation merges with the IT world. The respective

views toward the topic of safety differ significantly: The internationally used terms are "Safety" for machinery safety and "Security" for IT and data security; this helps with the basic differentiation. However, the challenge lies in standardising the needs of both worlds to form appropriate, practical solutions. The new safety objectives include, for example, the protection of production data, product and plagiarism protection, know-how protection, access protection, integrity protection and remote maintenance.

One principle for sustained market acceptance is to create standardised mechanisms in communication between machines and within the machine. Practical solutions – that are acceptable to users – will only arise if the requirements of both worlds are considered.

Automation following the mechatronic approach

Additional challenges in the initiative Industry 4.0 arise in terms of modularisation, networking and distribution of control functions into small and ever smaller subfunctions.

In order to be able to respond to changing requirements in production flexibly and quickly, a modular structure of plant and machinery is increasingly important. With this, engineering processes can also be simplified and the reusability of the individual units can be increased. To do so requires automation systems that are able to control the intelligence distributed in the mechatronic units in a centralised, user-friendly way. Plants can then be broken down into manageable, independently functioning units.

With the centrally configured PLC controllers that are used today, the advantages of modularisation cannot be fully exhausted:

Changes in individual plant sections have disproportionately far-reaching effects at control level because all program structures and the communication relationships between the modules at central points in the control system then need to be modified.

That's why the automation of the future demands solutions that are able to both distribute control intelligence and at the same time guarantee that the necessary networking of several control systems remains easy for the user to handle. With the automation system PSS 4000 and the real-time Ethernet SafetyNET p, Pilz is pursuing a consistently modular and distributable approach that already enables you to reap the benefits of a decentralised control structure

Distributed intelligence

In future, intelligent sensors and actuators in distributed systems will take over more and more functions from control units. The goal is better interaction between individual machine modules and between man and machine. Safe motion controllers that are linked synchronously by real-time Ethernet already incorporate local control and evaluation functions. Pilz is also paving the way in this direction with intelligent camera systems for three-dimensional safe zone monitoring and a camera-based protection and measuring system.

Industry 4.0 in Pilz production

Production at Pilz is integrated with the upstream and downstream processes and procedures in the spirit of Industry 4.0. The legacy production operations already featured IT-based production processes, such as an intelligent RFID-supported workpiece carrier. These processes have been adopted and now gradually supplemented: In the new Peter Pilz Production and Logistics

Centre in Ostfildern, Pilz is using the deliberate gathering and processing of machine data to optimise the production control. That avoids disruptions or downtime. Work documentation will in future be stored in a Pilz cloud to always make it available up to date and in real-time on mobile devices. Other firm moves to bring about IT and production convergence are taking shape in the “Pilz Think Tank 4.0”: This makes the resources for implementing Industry 4.0 at Pilz available to IT and production technology experts.

About Industry 4.0

The Industry 4.0 initiative is part of the German government's high-tech strategy going forward to 2020. The discussion about Industry 4.0 or Integrated Industry is characterised by rising demands on productivity, flexibility and the availability of plants and machinery. To withstand international competition, the industry needs plant and machinery that enable it to manufacture individual products in a way that is both resource-friendly and as efficient as possible. The use of internet technologies is making production and logistics processes in factories ever more intelligent – but also more complex. In production we are seeing what are known as Cyber-Physical Production Systems (CPPS) with intelligent machines, warehouse systems and equipment that exchange information independently, instigate action and control each other. They can optimise industrial processes in terms of production, engineering, the use of materials and supply chain and lifecycle management.

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Caption:

“Safety is a critical success factor for Industry 4.0” says Susanne Kunschert, Managing Partner of Pilz GmbH & Co. KG.

Photo: Pilz GmbH & Co. KG



Caption:

Modularisation and distribution of control intelligence are two important demands on automation systems that meet the requirements of Industry 4.0.

Photo: Pilz GmbH & Co. KG

Texts and photos are also available to download from www.pilz.de.

The Pilz Group

The Pilz Group is a global supplier of products, systems and services for automation technology. Based in Ostfildern, near Stuttgart, the family-run company employs around 2,400 people. With 42 subsidiaries and branches around the world, Pilz supplies safe solutions for people, machinery and the environment. The technology leader offers complete automation solutions comprising sensors as well as control and drive technology – including systems for industrial communication, diagnostics and visualisation. Consulting, engineering and training round off its international range of services. In addition to mechanical and plant engineering, solutions from Pilz are used in many sectors such as wind energy, railway technology and robotics.

Contact for journalists:

Martin Kurth

Corporate and Technical Press
Tel.: +49 711 3409-158
m.kurth@pilz.de

Sabine Karrer

Technical and Corporate Press
Tel.: +49 711 3409-7009
s.skaletz-karrer@pilz.de

Jenny Skarman

Technical Press
Tel.: +49 711 3409-1067
j.skarman@pilz.de