

# PRODUCTION manager

Magazine for logistics & production



PSI Logistics is one of the TOP 100

## Innovations are no coincidence

### User report

Process-optimised vehicle  
assembly at DAMMANN  
Success is in the detail

### User report

Vertical and horizontal  
integration at its best  
New production management  
system at Krakatau Steel

### Product report

Industry 4.0/The Industrial  
Internet of Things-enabled  
**monitoring system with  
responsive design**  
Web-based simulation with  
Qualicision®

## EDITORIAL

Dear readers,

At the moment, the industry is facing a technological revolution. Intelligent production systems are becoming increasingly important to secure the competitiveness of the individual plant and the complete global production network.

Digitalisation will be the main driver of productivity, flexibility and quality in the future. Self-learning and optimising systems, robustness against malfunctions, and the avoidance of critical conditions are only some of the benefits of these comprehensive automation solutions.

The production management of tomorrow requires integrated thinking. The structural transformation of exist-



ing production installations will largely take place within the scope of modernisation projects.

PSI Metals and Primetals Technologies combine their leadership positions in plant building, process automation and advanced planning and logistic systems to the benefit of the customers. We are driven by full dedication to the metals business and believe in the ongoing data integration and optimisation in production. We concentrate our efforts to go beyond limits (for further information, please read page 10).



Hans Jürgen Zeiher  
Head of Electrics and Automation  
Primetals Technologies

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PSI Logistics is one of the TOP 100

## Innovations are no coincidence

**T**he PSI Logistics has the distinction of being one of the most innovative of German SMEs. A glance at the current product developments illustrates and underlines the reasons for the award.

On 24<sup>th</sup> June it was made official: PSI Logistics is one of the top innovators in Germany. Managing directors Dr Giovanni Prestifilippo and Sascha Tepuric received the Top 100 seal for special innovation and superior innovation successes at the German SME summit. In giving the award, the jury distinguished PSI Logistics as one of the most innovative of the German SMEs, making it officially part of the German innovation elite.

The companies that have been distinguished with the compamedia GmbH Top 100 seal, which is based on a current evaluation, have ranked among the pacemakers of their sectors since 1993. The companies honoured so far include 97 national market leaders and 32 world market leaders. On av-

erage they recently achieved 40% of their turnover with market innovations and product improvements that put them ahead of their competitors in the market.

The team from the Department of Entrepreneurship and Innovation of the Vienna University of Economics and Business, under the scientific guidance of Professor Nikolaus Franke, reviewed 4000 companies this year. They were impressed by the very good internal innovation climate at PSI Logistics, which integrates ideas from customers, employees and partners such as the Fraunhofer Institutes, the Technical University of Berlin and RWTH Aachen University.

“I see the award as recognition of our consistent development work, where



we proactively link the requirements of the market with current results from science and research, integrate them into our product range and create both future-proof applications and long-term investment security for the customers”, explains Dr Prestifilippo. “We will continue to follow this path”.

## Features and modules that differentiate PSI Logistics from the competition

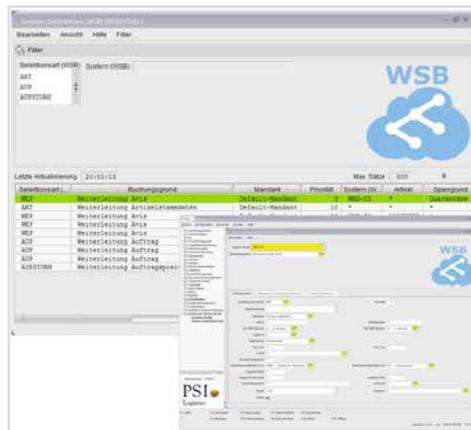
The software company specialising in logistics has in fact demonstrated its innovative strength over and over in recent years, establishing itself as an innovative leader in the software market. An example is the development of numerous features and modules for the products in its PSI Logistics Suite that differentiate it from the competition. Their functions range from holistic warehousing through transportation to planning, optimisation and control of the entire supply chain on both operational and strategic levels. Thus, in the Smart Logistic Grids (SLG) research project sponsored by the German Federal Ministry for Economic Affairs and Energy (BMWi), the top innovator recently developed the foundations for an IT system that, among other things, identifies the impact of traffic and weather data on the supply chain in real time and indicates alternatives if necessary. The risk management system for logistics networks cuts supply delays, lowers downtime and transport costs and reduces CO<sub>2</sub> emissions. “The results of such research projects have a direct influence on the further development of products in the PSI Logistics Suite”, says Dr Prestifilippo. An example of this is the influence on PSIglobal, which functions as the standard software for the strategic and tactical analysis, planning, design and optimisation of logistics networks and forms the IT basis for the SLG research project.

In parallel, state-of-the-art technologies are integrated into the corresponding future-oriented features, modules and business ideas of the IT company. PSI Logistics also already

provides practical applications in the field of the Internet of Things (IoT). “IoT chips are currently among the most important tools for the digitalisation and implementation of future projects such as Industry 4.0 and the Internet of Things”, is how Dr. Hans Thomas Nuremberg, Head of Technology at PSI Logistics GmbH views the technology.

## PSI Java-based framework an important component

So-called IoT chips (“iBeacons”) with small Bluetooth transmitters are the basis for innovative PSI solutions such as in the fields of localisation, indoor navigation, motion detection and fill-



Warehouse Service Broker in PSIwms.

level monitoring. Based on these, PSI Logistics has developed an innovative application for tracking dispatches: Smart Parcel. This allows packages to determine their own routes, to capture motion and environmental data such as temperature or changes of position using integrated sensors, and to transmit their location in real time.

Technology transfer within the PSI Group is an essential basis for the innovative power of the company. An important component of this is the common software technology platform of the Group, the PSI Java-based



At PSI Logistics, collaborative products are created in close cooperation with customers, suppliers, colleagues, universities and partners.

framework. As a strategic modular system, it makes innovative features, modules, technologies and differentiating characteristics available to all the products of the Group companies: anything that is advantageous to the users is integrated into the products of other Group subsidiaries with product-specific customisation.

This ranges from, in the example of the current release (3.5) PSIwms warehouse management system, the intuitive PSI-Click Design, which allows users to design their own PSIwms 3.5 interfaces and connect individual dialogues in a process-oriented manner, through diagrams for Cockpit and Dashboard that can be combined at will, up to the control system with cockpit functions for mobile terminals, which was developed on the basis of the framework module for mobile service solutions (MOSS). With a custom user interface and apps for mobile terminals or optionally via web browser, the control system not only makes it possible to access defined Key Performance Indicators (KPI) and the system control via smartphone or tablet; rather, necessary process manipulations can also be implemented in real time.

## An overarching WMS with Warehouse Service Broker

With innovative features such as multi-user capability, PSI Logistics

has made its mark in the field of warehouse management—and sets the bar very high for subsequent developments of competitors. Features and optimisation modules, such as adaptive scenario management and adaptive order start, with which optimised process sequences can be automatically initiated in order-based manufacturing according to plant utilisation and demand, are product features that differentiate the company from the competition. The same applies for the integrated Warehouse Service Broker in *PSIwms*. As an intermediate level below the ERP system, it coordinates and controls the WMSs of multiple locations—irrespective of the manufacturer of the software solutions. This allows *PSIwms* to be used as an overarching WMS. It clusters multiple physical warehouses and allows end-to-end networking and transparency with all the advantages of a multiwarehouse inventory-management and -optimisation system.

The comprehensive, multisite coordination and control of warehouse processes and distribution offers significant cost and efficiency benefits for users. Another current example of the development of systems and modules is provided by the functions for an automated tender-management system, which is now used by several renowned logistics service providers, such as Hellmann Worldwide Logistics GmbH & Co. KG. With the modelling components, service providers tailor their bids for tendering processes precisely to the special logistics requirements of the shipper and adjust them optimally according to their logistics network.

Tender Management also makes possible the specific calculation of each

cost block. “A costing tool that we can use to cover almost all customer-specific variables, in addition to the standard and in-house rates”, explains Marco Novak, Project Manager for Business & IS Solutions at Hellmann. Hoffmann uses the automation components of Tender Management to reduce the time needed for costing complex tariffs with larger amounts of data considerably—in extreme cases from practically a whole day to 30 minutes. “The more complex the request, the more time we save”, says Novak.

and concerted optimisation of production and logistics. Reference projects show that users have access to additional cost-reduction potential in the double-digit percentage range depending on sector, size and structures.

The examples above show how widely positioned the company is in the optimisation of logistics processes with its PSI logistics suite. “The high level of market acceptance of our products is based not least on the principle of the collaborative product, which integrates the requirements of the customer with the latest technologies”, says Dr Pres-



*PSI Logistics offers modern and robust software solutions.*

### Additional cost reduction potential in the double-digit percentage range

Very recently, PSI Logistics became a pioneer in accessing additional savings potential through comprehensive consideration and combinatorial optimisation of production and logistics processes. As one of the first software companies, at the LogiMAT 2016 trade fair it presented a newly developed core module of its PSI logistics suite that includes functions and algorithms for the combined evaluation

tifilippo. “Innovativeness and innovation are not coincidences, but result from continuous work on several market-relevant levels. We keep this in mind—and with the customer on our side, we can further strengthen the innovativeness of PSI Logistics”. 

**PSI Logistics GmbH**  
Phillip Korzinetzki  
Marketing Manager  
Phone: +49 231 17633-280  
p.korzinetzki@psilogistics.com  
www.psilogistics.com

User report: Process-optimised vehicle assembly at DAMMANN

## Success is in the detail

By using the PSI*penta* ERP suite, northern German vehicle and equipment manufacturer Herbert Dammann GmbH is able to successfully optimise and automate its highly complex manufacturing process. The software permits maximum flexibility in production, which primarily benefits DAMMANN's customers.

The 130-employee operation produces plant-protection equipment for the agricultural sector as well as de-icing equipment for municipalities and the aviation industry. DAMMANN vehicles are used worldwide for spraying plant-protection products on farms or de-icing airport runways.

### Precision reduces costs

Customers appreciate the high precision of products. "We can distribute a shot glass of liquid over an area of up to one square metre. And we do

are often very expensive, the customers save cash thanks to this highly efficient means of application. But this accuracy is not the only reason for the vehicle manufacturer's global brand awareness and 45% export quota. The highly individual nature of the products also lies behind DAMMANN's success: studded or solid tyres, dual or quad nozzle booms, 10 000 l or 12 000 l barrel: "We can respond to almost any customer preference, and manufacture to a certain extent like a cottage industry", says Plant Manager Frank von Bargaen.



Dammann vehicles are used worldwide for applying liquids.

it while travelling at ten, twelve or more kilometres per hour", says Lars Meinking-Dammann, responsible for product and quality management in the company. Since the sprays used

### Expansion reveals the limits of the old system

Due to the constantly growing demand for ever more complex devices, the family company grew rapidly and

consequently expanded its production capacities. DAMMANN invested in new, larger company premises. However, this expansion soon encountered a limit in terms of IT. "We had more than doubled our number of employees within a period of three years. By then it was clear: we needed a new ERP system", says von Bargaen.

### Manual inventory management abolished

Prior to the introduction of a new ERP system, the organisation of processes related to material procurement in particular was insufficiently efficient. Employees would walk through the warehouse, checking the stocks and calculating the quantities of parts to order on the basis of their personal experience. Since the comprehensive modernisation using the PSI*penta* ERP standard, these rather time-consuming processes have become a thing of the past. Orders and materials management are interwoven, parts lists can be automatically managed and all processes—from ordering through production up to the delivery slip and invoice—are seamlessly integrated in the new PSI Automotive & Industry ERP. "Our target now is to have all the material for a new device or vehicle available at least five days before the start of production. And we generally succeed as well", reports head of IT Lemmel.

### Variant management now automated

Against the background of the multitude of possible product variants to be considered in order-based manu-



PSIpenta unites orders and materials management in production.

facturing at DAMMANN, convenient and flexible variant management was given a high priority when selecting the new ERP system.

Thus, when DAMMANN manufactures a device or vehicle for the first time, the appropriate product configuration is first defined and created as a new standard parts list in the system. This parts list is available for call-out for subsequent orders and already covers on average more than 90% of all required parts for the relevant product in materials management.

If the product configuration varies only slightly for subsequent orders due to individual customer preferences, this usually requires the deployment of significant IT resources. "If you break them down to the last screw", says plant manager von Bargaen, "the parts lists of certain build types theoretically contain up to 25 000 items".

In order to minimise the complexity of the product configuration, the PSI Automotive & Industry ERP suite therefore offers the opportunity of

filtering individual product features in the system such that the scope of the relevant parts lists is limited to only slightly more than 2 000 items. "The product configurator with its convenient filtering system is one of the real strengths of PSpenta/ERP".

### CAD integration streamlines processes

DAMMANN also benefits from a flexibility in the system that goes beyond the production process, because the ERP suite permits a barrier-free link to design. As such, the DAMMANN engineers create their drawings in CAD. In parallel, they also update the article and parts lists. At the push of a button, this data is then transferred to Procurement. This process adds a similar degree of convenience to the creation of the spare parts catalogue, where it is just as easy to add new parts.

It was also important for the SME that the new ERP system "can be adapted to our way of working and we do not have to jump through hoops to fit in

with the software", says head of IT Lemmel. In Sales, for example, the company has created its own start screen for customer processes.

Lemmel calls the decision in favour of the Berlin-based software supplier PSI Automotive & Industry and its software "altogether right". In future, DAMMANN intends to exploit the wide range of options provided by the software even further. In particular, this involves document management and capacity planning. Finite capacity scheduling is already firmly planned as the next step. This will help optimise the production sequence. The detailed interventions and automation mechanisms are sure to once again ensure maximum benefit at the very successful northern German SME. 

#### PSI Automotive & Industry GmbH

Dolores Schmidt  
Marketing Communications  
Phone: +49 30 2801-2130  
dolores.schmidt@psi.de  
www.psipenta.de

User report: Vertical and horizontal integration at its best

## New production management system at Krakatau Steel

Seamless integration, one of the main drivers toward intelligent production, was the main motivation for Krakatau Steel in Indonesia to replace its legacy system by installing a modern, highly sophisticated production management solution. The aim was to achieve automation of horizontal integration, from melt shop to cold rolling mill, and vertical integration, from SAP to the shop floor. Together with Krakatau IT, a 100% subsidiary of Krakatau Steel, PSI accepted the challenge. The PSImetals application was implemented, resolving all Krakatau Steel's requirements to the customer's full satisfaction.

**K**rakatau Steel was founded in 1970 and has grown to be the largest steel producer in Indonesia, with a production capacity of 3.15 million tons per year. In addition to holding the domestic market, the company also relies on the export of steel products to increase its sales volume.

Krakatau Steel produces a number of major products such as hot and cold rolled coil and is on target to increase its production capacity to 4.65 million tons in 2017. This will be achieved by increasing the production capacity of hot rolled coils to 1.5 million tons.

Driven by that impressive growth within a few decades, and the further increase of production complexity due to the planned extension of capacity in the near future, Krakatau Steel decided to replace its existing legacy MES system with a modern and highly sophisticated production management solution. For Krakatau Steel, seamless vertical integration with its SAP system was a vital requirement to gain benefits from a connection between the formerly separated worlds of commercial and production driven business processes.

Another requirement for the new production management solution was its

capacity to handle the complete production process from steel making, via casting and hot rolling, through to the cold mill area. This horizontal integration suggests great potential for process improvements can be expected.

### Krakatau Steel, Krakatau IT and PSI: unbeatable as a team

After a short but intensive evaluation process, PSI was chosen to realise these demanding requirements. For Krakatau IT, it was essential to have a local partner onsite with the necessary understanding of customer processes. To get their experts "PSImetals ready", PSI was able to organise extensive training at PSI premises in Europe, as well as onsite in Cilegon, Indonesia.

### PSImetals—a flexible product

In recent years, PSI has been focusing on and investing in the configurability of its product, PSImetals. This investment allows partners like Kraka-



Krakatau Steel focuses on innovation—also in the field of production management.

tau IT to support the installation and configuration of *PSImetals* solutions at customer sites. *PSImetals* has now evolved to be the de-facto industry standard, which makes real modifications of the software only necessary in exceptional cases. For Krakatau Steel, PSI delivered an integrated solution based on the *PSImetals* components Caster and Hot Strip Mill Scheduling, Production and Quality for the Melt Shop and downstream lines, as well as Material Management along the full process. *PSIntegration* is handling the task of seamless integration with SAP and process automation systems. For some areas it was necessary to integrate the shop floor via PDA-screens. To keep the initial project costs low, Krakatau Steel decided to adhere to the *PSImetals* standard as much as possible.

To demonstrate flexibility, configurability and robustness, *PSImetals* had to undergo a real stress test. An additional one hundred screens and reports were generated by Krakatau IT for two reasons:

1. To simplify the change process for the users at shop floor, and
2. To close the gaps in areas with limited process automation support.

The integration with SAP was supported by sophisticated test scenarios jointly developed, prepared and finally executed by Krakatau IT and Krakatau Steel.

Special attention was given to the scheduling of the hot rolling mill and the material assignment before rolling. *PSImetals* Hot Strip Mill Scheduler analyzes slab characteristics and dynamically assigns the material in parallel to the actual scheduling.

To support the management of Krakatau Steel in their decision making process, Krakatau IT has developed a

## Flash-Interview

with **Krisna Putra**, project manager, Krakatau Steel

**PSI:** Mr. Putra, what was the main reason for selecting PSI as the vendor for your new Production Management solution?

**Krisna Putra:** The main reason for choosing PSI was its experience in metals and hence their understanding of our industry and processes.

**PSI:** The PSI team was mainly coming from Europe—have there been any cultural challenges?

**Krisna Putra:** The challenges were less of a cultural kind but more con-

nected to the time difference. Indonesia is seven hours ahead. This made communication more difficult and physical visits were expensive. But it was worth it:

**PSI:** What are the main benefits of the new system?

**Krisna Putra:** One benefit of the new system is that we have, now, a flexible and close integration with SAP. Another one is that PSI's software can be adjusted or modified easily if we have new requirements.

mobile app for Android devices based on the *PSImetals* Factory Model.

### Every good story has a happy ending

It was clear from the beginning that the replacement of a legacy MES system, developed at need over a period of years along the full steel production process, would not be an easy task to achieve. PSI's collaboration with Krakatau IT led to additional investments to facilitate essential knowledge transfer, for example by accounting for localised methods of operation when the temporary shutdown of liquid production was required. The change process itself also called for close attention. There were high expectations of the new system to function sympathetically with the well-known and beloved functions and behaviours of the old system.

But the essential precursor to all activities was the motivation of all stakeholders to finalise the project successfully by working together in a collaborative and open atmosphere. At the end of the day, all parties were rewarded with success. Thanks to the experience of PSI experts on the one hand and the agility and motivation of Krakatau IT as local implementation partner on the other, Krakatau's new production management solution went live in May 2016. Krakatau Steel has made a great step towards an IT-driven intelligent production system. 

**PSI Metals**  
Raffael Binder  
Director of Marketing  
Phone: +43 664 8364445  
rbinder@psi.de  
www.psimetals.de

News: Primetals Technologies and PSI are working together on intelligent production

## Industry 4.0 from one source

In July, Primetals Technologies and PSI signed a cooperation agreement on the distribution and implementation of production-management solutions for the steel and aluminium industry. This provides the customer with optimally matched and customised holistic solutions consisting of equipment, basic (Level 1) and process automation (level 2) from Primetals Technologies and the PSImetals production-management solution (Level 3) from PSI—all in the sense of Industry 4.0.

We invited Hans-Jürgen Zeiher, Head of Electrics and Automation at Primetals Technologies, and Detlef Schmitz, Managing Director of PSI Metals to a joint interview.

**Mr Zeiher, I would like to start with you. What makes a well-established plant engineering company and specialist in the field of process automation for steel and aluminium production, such as Primetals Technologies, enter the “soft” world of data processing?**

Zeiher: At Primetals Technologies we are firmly convinced that the megatrend of digitalisation will also have a significant impact on the future of metal production.

The future sustainability of the industry itself will depend on the implementation of intelligent production in the form of a fusion of equipment and software. This requires a production management system that integrates plant engineering, process expertise, automation and digital production. This is why we have opted for a strong partner that is recognised in our industry and that contributes the necessary expertise.

### Hans Jürgen Zeiher

was born on 20 June 1972. He studied Electrical Engineering at the University of Karlsruhe and started work in 1999 in the field of industrial plant engineering at Siemens AG. Since May 2015, he has been head of the electrics and automation business segment at Primetals Technologies.

### Detlef Schmitz

was born on 29 November 1954. He studied Electrical Engineering at the Niederrhein University of Applied Sciences and has been with the PSI Group since 1981. He has been managing director of the subsidiary PSI Metals since January 2000.

**Mr Schmitz, how did this cooperation come about? Primetals Technologies is massive compared to PSI Metals; are you worried about being a “junior partner”?**

Schmitz: PSI has always had close contact with plant engineering companies. This is the only way we could make our interfaces suitable and offer a continuous system integration. The current market environment requires

even closer coordination for us to be able to make joint investments to deliver solutions that allow the end customer to get the most from their facilities. At my age I am thoroughly enjoying the role of junior partner! But seriously, the collaboration works as a partnership and on an equal footing.

**To you both: Industry 4.0 is now a global term for the progressive digitalisation of industrial production. How do you view this development for a traditional industry such as metal production?**

Schmitz: Although often perceived as conservative, in my view the metals industry is ahead in the field of Industry 4.0. Key terms such as model-based production or continuous system integration are long-established in our industry. Now it is also important to use new developments from the non-industrial field together with our customers to continue to improve production processes. In the current market situation, our customers need to deliver the right quality at the right time while working productively. Production management is a key component in achieving this goal.

Zeiher: I feel the same way. From our point of view, the potential of Industry 4.0 lies in the fusion of the previously separate worlds of plants and software. From the customer's point of view, it is important to improve productivity, quality and flexibility. Once a certain level of development has been achieved, this can only be

accomplished using comprehensive automation concepts. In the future, these automation concepts could use self-learning cross-plant systems to harness further optimisation potential and detect and prevent critical situations at an early stage. Manual intervention will be supported by assistance systems or in some cases become completely obsolete.

**Mr Zeiher, what can customers expect from this partnership in the short term? What are the much-vaunted customer benefits?**

Zeiher: Together with PSI, we can offer our customers a one-stop shop. Production equipment, process technology, automation and production management from a single source. The entirety is supported by more than 450 experts available worldwide in the field of implementation, service and advice.

**Mr Schmitz, as managing director of PSI Metals, what do you expect in the medium to long term from this cooperation with one of the biggest names in plant engineering and process control—a traditional “hard” worker?**

Schmitz: I see the biggest benefit for our customers in the global service network mentioned by Mr Zeiher; Primetals Technologies provides additional skilled employees in the most important countries where steel and aluminium are produced and processed. From a technological point of view, I expect our product to benefit greatly from the new proximity to the production plant and the opportunities on offer. Even the initial talks between our colleagues have shown that

there are many opportunities for customer benefits through closer coordination of the Primetals Technologies’ plants with PSI software.

**To conclude with a question to both of you: What is your vision for the metal production of tomorrow?**

Schmitz: As an old hand, I see the future of our industry positively, despite

Zeiher: It’s good to hear a positive view of the future for our industry for a change. In fact, I see it as our responsibility to work with customers on a positive vision and to implement intelligent production through the interaction of plants and software. However, with all enthusiasm for technology one should always keep the goal in mind. For our customers, this means creating a production en-



*Hans-Jürgen Zeiher and Detlef Schmitz signing the cooperation agreement.*

many pessimistic opinions. My vision is based on the following three assumptions:

1. The metal industry will continue to be an important economic factor in Europe in the future.
2. Environmentally friendly production implemented in Europe will find application around the world.
3. IT systems will enable producers to provide customers with even smaller batch sizes in the shortest possible time and with a defined quality and punctuality.

vironment that offers unprecedented opportunities in the area of flexibility in conjunction with quality and productivity.

**Many thanks for the interview.** 

**PSI Metals**  
Raffael Binder  
Director of Marketing  
Phone: +43 664 8364445  
rbinder@psi.de  
www.psimetals.de

User report: Increased efficiency using PSIlwms at HECO-Schrauben

## A completely successful solution

The warehouse management system PSIlwms ensures coordinated control of largely automated intralogistics processes at the new distribution centre of screw and bolt manufacturer HECO-Schrauben. Sophisticated picking strategies with specially tailored dialogues increase efficiency and quality in inventory management, contract manufacturing and service.

**B**etter safe than sorry is the guiding principle of HECO-Schrauben GmbH & Co. KG, headquartered in the Black Forest town of Schramberg.

Founded in 1967, the family company operates in 30 countries worldwide, and its production volume of around 1.5 billion screws per year makes it one of the leading manufacturers in the industry. Ageing intralogistics were increasingly proving to limit the continuous growth in orders and business. In 2012, the company decided to build a new logistics centre to increase storage capacity and efficiency.

“The logistics centre is the logical response to the ever-increasing demands on goods and materials management”, says warehouse manager Torsten Hettich. “This ranges from the system equipment to optimum process control using a flexible warehouse management system”. The new logistics centre with high-bay warehouse, automatic small-parts warehouse and generously proportioned picking and shipping area has been in operation since the beginning of 2014.

“5 000 pallet spaces, 50 000 carton spaces, state-of-the-art picking technology and fully automated processes

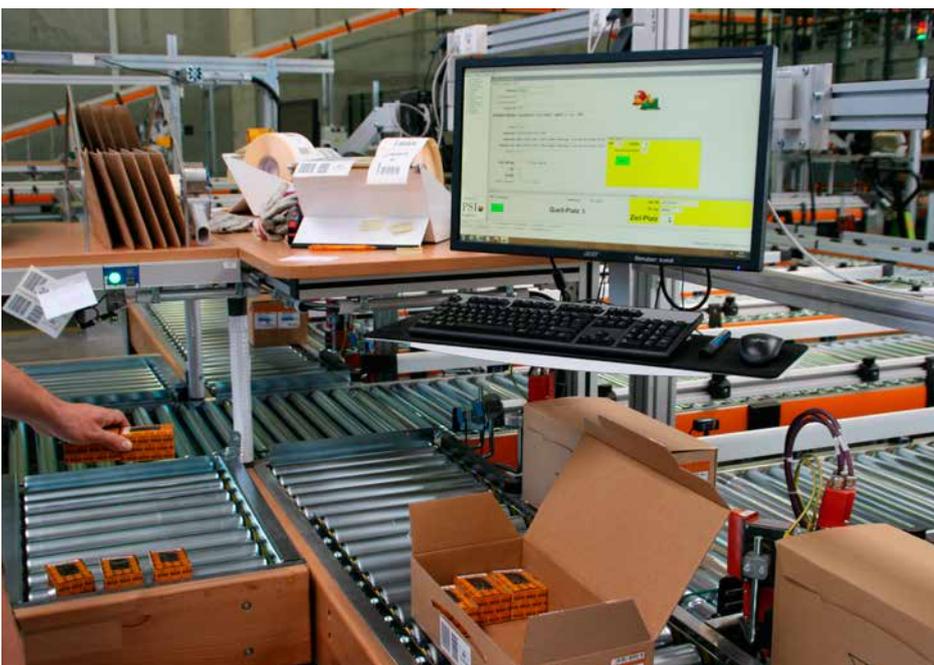
offer extensive capacity and provide for significantly increased throughput”, summarises Hettich. “The most important processes in the warehouse are largely automated”.

### High flexibility and security of investment

The PSIlwms warehouse management system from PSI Logistics provides the IT basis for inventory management, coordination and process control. “It is a powerful WMS that gives us high flexibility and investment security and was able to be tailored exactly to our requirements in terms of functional scope and the necessary dialogues”, is how Hettich justifies the surcharge.

PSI Logistics provided the wireless data terminals required for process execution and installed the interfaces to the material flow computer and HECO host system. In addition, all HECO-specific processes were entered into PSIlwms by way of numerous customised programming operations. Within nine months, PSIlwms had been exactly tailored to the requirements of the screw manufacturer’s logistics centre and implemented. “In conjunction with the material flow control system of the plant supplier, the best solution”, is how the warehouse manager views it.

Shuttle traffic brings goods for storage from the production building a few hundred metres away. Pallet conveyor technology carries the palletised cartons of screws and bolts into the logistics centre. After recording and entry into the IT system, the pallets are taken to the high-bay warehouse.

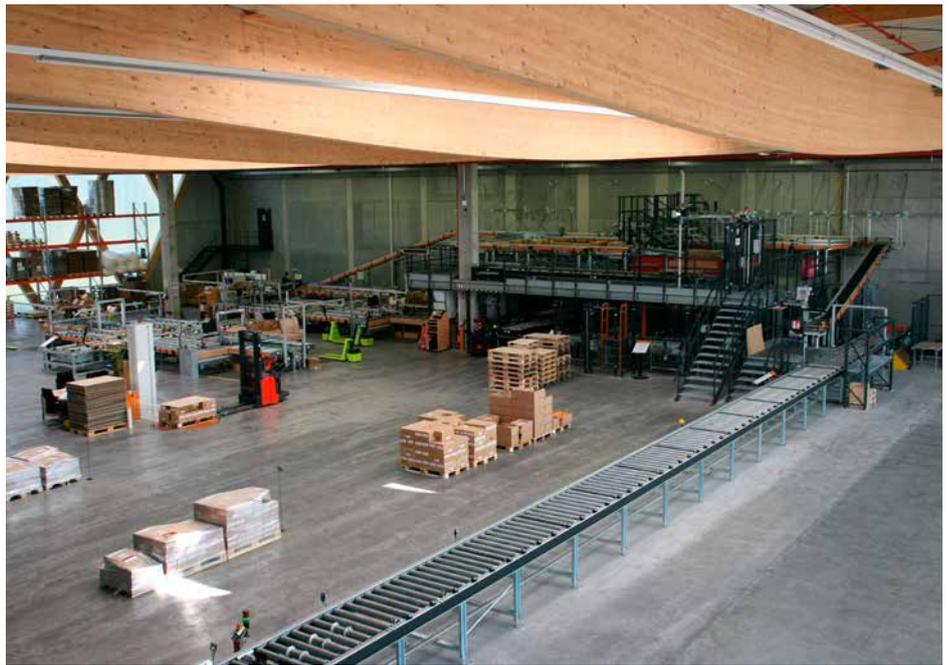


With its new dialogue interfaces, PSIlwms indicates the source carton to the pickers and specifies the appropriate target container.

There, storage-and-retrieval machines (SRMs) store the pallets double deep in one of the two warehouse lanes following the specifications of the material flow computer (MFC). The MFC reports the storage location to the PSIlwms that manages inventories, retrievals and picking processes. "For recording incoming goods, new dialogues were created in PSIlwms with project-specific input screens", explains Christian Welter, project manager at PSI Logistics.

### Efficient and highly secure processes

To stock the automatic small-parts warehouse, the WMS directs pallets from the high-bay warehouse to an automatic depalletiser, which carries out the separation. A conveyor section then leads the cartons to an automatic labelling system, where the



*Upstream picking and provisioning zone.*

these stations. PSIlwms coordinates the retrieval of the required cartons from the automatic small-parts warehouse according to stored strategies

A retrieval branch leads the cartons to the packing area where the shipping packages are sealed, labelled and transferred to the goods issue area. By means of a built-in balance in the conveyor, PSIlwms checks that the order has been correctly prepared by comparing the stored master data with the order data and the corresponding weights of the picked items.

"An altogether successful solution", says satisfied warehouse manager Hettich. "PSIlwms provides for efficient and highly secure logistics and picking processes with which we can meet the current and future challenges in the market. It's an investment that completely suits the motto of our company, 'Better safe than sorry'".

PSIlwms provides for efficient and highly secure logistics and picking processes with which we can meet the current and future challenges in the market.

**Torsten Hettich**

Warehouse manager at HECO-Schrauben GmbH & Co. KG

cartons are given individual barcode labels before being ejected onto the storage branches for the three lanes of the automatic small-parts warehouse and stored. PSIlwms directs any remaining partially unloaded pallets back to the high-bay warehouse.

HECO supplies mainly specialist markets from the new logistics centre. Eight picking stations are set up for order-based manufacturing. Source cartons, shipping cartons and shipping pallets can be packed at

per delivery to the respective picking stations for carriers and express parcel couriers. The order picking processes are supported by a light system based on the pick-from/pick-to principle. PSIlwms indicates the source carton to the pickers on new dialogue interfaces and specifies the relevant target container. Each picking station can accommodate picking for up to four destination cartons. In addition, each picking station has two target-pallet spaces.

**PSI Logistics GmbH**  
Phillip Korzinetzki  
Marketing Manager  
Phone: +49 231 17633-280  
p.korzinetzki@psilogistics.com  
www.psilogistics.com

Product report: Mobile apps for the metal industry

## PSImetals brings production to the mobile phone

No other device has had such an impact on our lives in the last ten years as the smartphone. Much has happened since Apple launched the iPhone in 2007, but the enthusiasm for this technology continues unabated. Twenty years after Bill Gates predicted “information at your fingertips” as long ago as 1995, it has now become a reality. The demand is also high in the industrial environment, but the actual application is sensitive. PSI works closely with customers in development to meet their needs and requirements in the best possible manner using the options provided by mobile applications.

Mobile terminals were an important issue for PSI even before the advent of smartphones and tablets. Hardly any plant can do without the support of a customised mobile warehouse management system for their warehouse employees. But the aim is to go even further. The goal is to make important information and control options for production available for users not only at their usual workstation. A number of mobile apps should ensure that in future the PSImetals user always has access to information to help perform current tasks in the best possible way. One way of achieving this is via the employ-

ee's personal smartphone. This provides effective and quick data access, with the issue of data security being paramount.

### PSImetals' KPI app for quick access to important production information

The first app will soon be released as an extension of the PSImetals KPI monitor for Apple iOS, Android and Windows phones. This app will allow users to access the current performance data for the equipment and the plant in a matter of seconds. Each user can configure an individual set of values to be presented when the application is opened. It will immediately

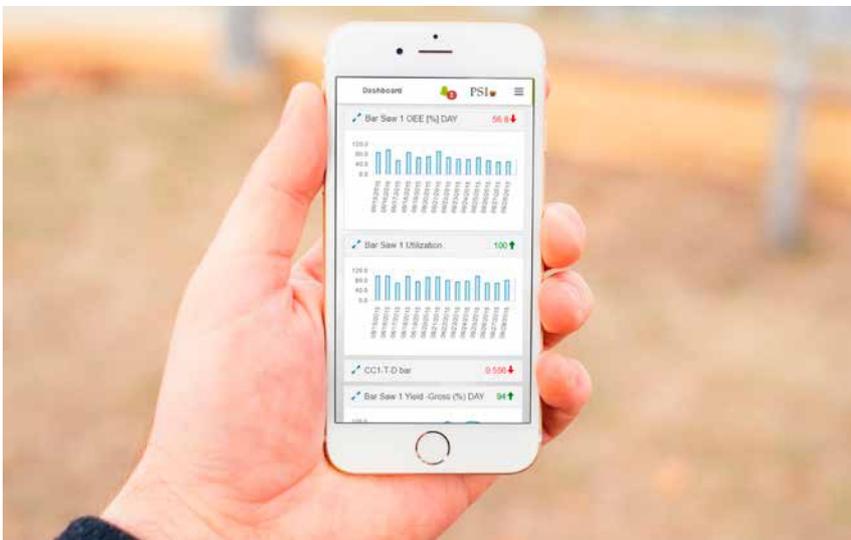
show and notify the user if any thresholds are being exceeded.

### Security and access protection

In contrast to a normal consumer app, an app for business applications has significantly higher requirements regarding data security, access protection and integration into existing system landscapes. PSI takes these requirements very seriously and its many years of experience in the metals environment enable it to offer sophisticated concepts. The top priority is for business-critical data never to leave the company network. PSI's tried-and-tested PSlauth authentication module provides protection against unauthorised access.

### The general market should not be in the role of a beta tester

Over the coming months, it is PSI's declared aim to offer a range of apps that bring their benefits from daily life into everyday working life. Industrial applicability and all the related requirements have the top priority in this. PSI will therefore first put the new apps through their paces with pilot customers so that general users do not become beta testers as is often the case in the consumer sector. By doing this, PSI will make possible the next step for the acceleration of processes to improve overall productivity and to support informed decision-making. 



With PSImetals apps, production is always within reach.

PSI Metals  
Raffael Binder  
Director of Marketing  
Phone: +43 664 8364445  
rbinder@psi.de  
www.psimetals.de

Product report: Industry 4.0/The Industrial Internet of Things-enabled monitoring system with responsive design

## Web-based simulation with Qualicision®

In the age of Industry 4.0/The Industrial Internet of Things production processes must maintain high performance in traditional desktop PCs as well as in modern web-frontend technologies at all times and even with high access figures and many data points to be processed, such as sensor data. The PSI subsidiary F/L/S Fuzzy Logik Systeme GmbH supports the web-based simulation of production sequences with Qualicision® its multicriteria software solution.

In an ongoing industrial automotive production process short-term process deviations, such as material-provisioning errors, have to be intercepted in a targeted manner. To this end, F/L/S implements modern web-frontend technologies and uses the Qualicision® simulation offline as a separate tool in addition to the online production systems in order to identify the impact of disruptions on a planned sequence at an early stage and to interactively mitigate this through short-term modification of the sequence specifications. Using the web frontend the sequence recalculated by the simulation and any disruptions or impacts that occur can be assessed at practically any workstation.

### In-situ coordination using mobile devices

Coordination with the divisions concerned to resolve possible disruptions and thus to re-evaluate the pending sequences can be effected in-situ by using, e.g. tablets or modern mobile phones. Thus the use of web technology saves time and reduces friction losses.

The orders to be sequenced and the warehouse stocks including expected addition to stocks are imported into the Qualicision® SK simulation. Af-

terwards the optimisation specifications are loaded or modified by the user. A distinction is made between technical requirements such as the interval between two demanding jobs (vehicles), and requirements regarding the number of units such as “Include 100 orders (vehicles) with four-wheel drive”. The importance of the individual requirements to each other can be controlled by assigning priorities. In the next step the simulation stores an internal virtual warehouse based on the input data and removes orders from the virtual warehouse to virtual assembly lines according to the requirement settings. The interaction between virtual movements of orders to and from an assembly line results in changes to the currently available inventory which means that the simulation encounters a changed situation after each individual step and optimises the selection of the next order for the sequence to be created.



Fig. 1: Mobile devices with Qualicision® simulation.

terwards the optimisation specifications are loaded or modified by the user. A distinction is made between technical requirements such as the

### KPIs and stock levels via mobile devices

Graphical displays show the stock levels and the utilisation of the assem-

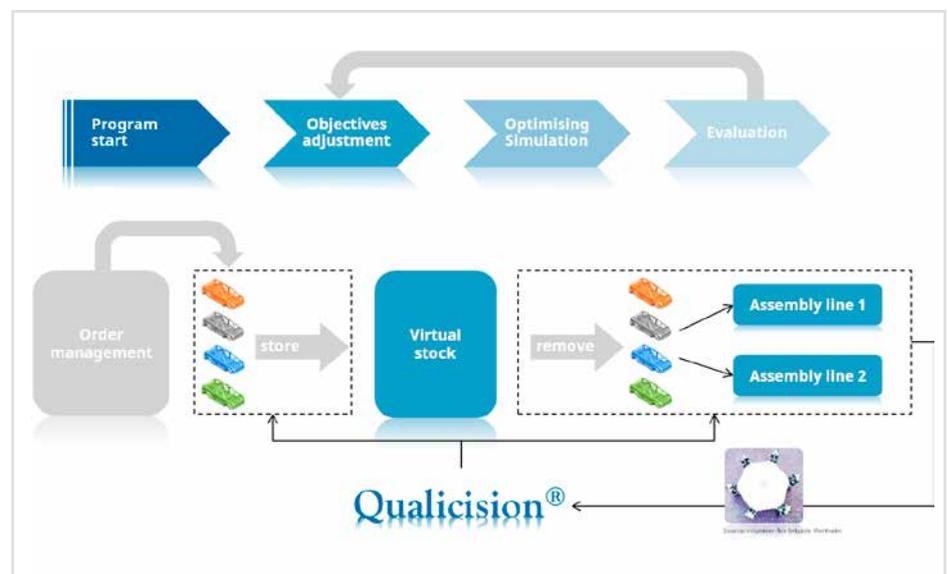


Fig. 2: The Qualicision® simulation sequence.

bly lines (see Fig. 1). The conflict and compatibility analysis is a key tool for analysing the sequences created for the individual assembly lines. This indicates which requirements are in conflict to each other and are very difficult or impossible to meet. In the next step the user can adjust the requirements to create a better, more homogeneous sequence. This is followed by restarting the simulation. This step is repeated until the required KPIs are achieved (see Fig. 2). The result of the simulation is that optimisation requirements are deter-

mined that take into account the current inventory situation, compensate for any disruptions as far as possible and achieve the desired KPIs.

### KPI-controlled I4.0 production

After the simulation these optimisation requirements determined by the web-based simulation possibly in situ are transferred in the production system so that a stable, harmonised production can be achieved.

By using web-based technology with a responsive design production sequences can be viewed and analysed

on almost any device with a web browser given the appropriate authorisations. The transparency of the production process towards Industry 4.0 production is improved and a consensus of all partners involved in the process can be achieved more quickly and efficiently. 

F/L/S Fuzzy Logik Systeme GmbH  
Rainer Albersmann  
Authorised representative  
Phone: +49 231 9700921  
albersmann@fuzzy.de  
www.qualicision.de

News: PSI Logistics modernises server infrastructure at the Vienna Airport

## New host computer hardware for the baggage handling system

PSI subsidiary PSI Logistics GmbH has successfully replaced the entire server hardware for the baggage handling system for the Flughafen Wien AG, operator of the Austrian capital's airport.

Contracted in January 2016, this replacement modernises the existing IT system with failsafe, redundant components in a new, virtual-server structure. This

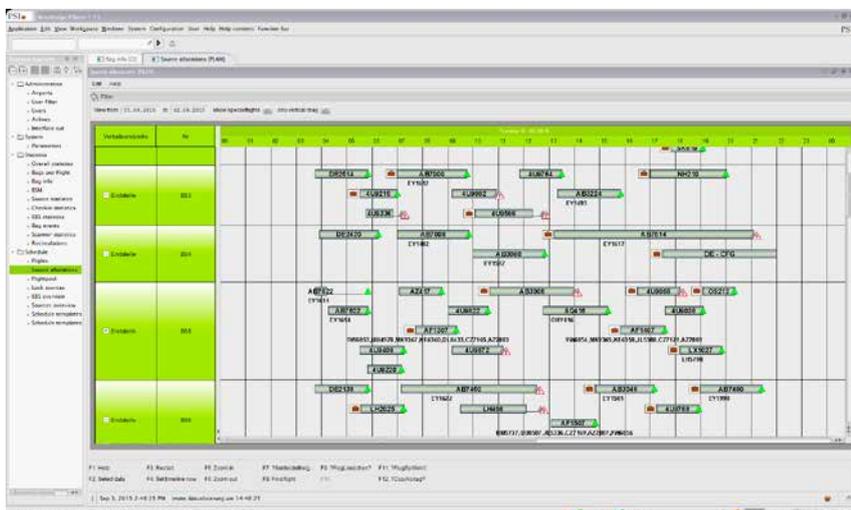
modernisation project—concluded at the beginning of June—establishes the basis for a subsequent retrofitting programme with which the baggage control system in Vienna will

be updated with state-of-the-art technology.

The new server infrastructure was designed by PSI Logistics to readily integrate additional IT systems, for instance, for process control and visualisation, as the system is expanded. The Vienna Airport will continue to rely on the established and proven PSIairport/BHS baggage handling system for the controlling and sorting equipment at the airport.

With about 22.75 million passengers in 2015, Vienna Airport is one of the most important hubs and destinations in Middle and Eastern Europe. 

PSI Logistics GmbH  
Phillip Korzinetzki  
Marketing Manager  
Phone: +49 231 17633-280  
p.korzinetzki@psilogistics.com  
www.psilogistics.com



Vienna Airport relies on the established PSIairport/BHS baggage handling system.

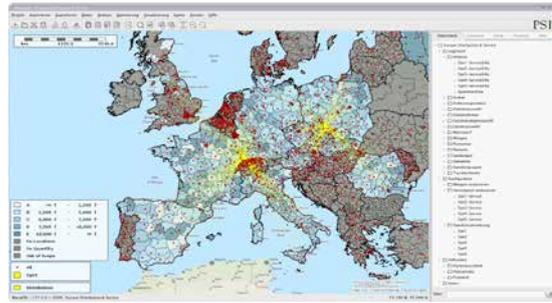
News: Coupling of PSIGlobal with the tender management system

## Optimised logistics network

With Rudolph Logistik Group, another well-known international logistics service provider relies on PSIGlobal and the tender management system from PSItms, as two parts of the PSI Logistics Suite.

With its scope of functionality, PSIGlobal covers the complete set of tools required for analysis and optimisation of the Rudolph network with about 40 sites in Europe and the Near East.

Coupling this with the tender management system with PSIGlobal, allows service providers to tune bids exactly to the requirements of the request for tender and to co-



PSIGlobal in usage.

ordinate them in a performance and cost-optimised manner with their own resources and the design of their

own network. For the most part the planning processes are performed automatically. This provides for significant savings of time in the departments involved. Beyond that, the planning data in PSIGlobal are placed in relation with the subsequently recorded actual data and further analysed so that the network is continuously optimised. 

PSI Logistics GmbH  
Phillip Korzinetzki  
Marketing Manager  
Phone: +49 231 17633-280  
p.korzinetzki@psilogistics.com  
www.psilogistics.com

Event: Information and ideas exchange in the PSI Havana Lounge

## PSI Logistics at the German Logistics Congress

Under the motto "Shaping the change", logistics experts from all sectors will be meeting again this year in Berlin when the 33<sup>rd</sup> German Logistics Congress opens its doors from 19 to 21 October. At no other event in Germany is the logistics market as accessible as at the German Logistics Congress. As is traditional, PSI Logistics will once again be there as one of the sponsors of this congress.

As in the last few years, the exclusive ambience of the PSI Havana Lounge will

provide an atmospheric and relaxing setting for a valuable exchange of information and ideas. The latest prod-

uct developments and pioneering solution approaches that the recently distinguished Top 100 innovator is offering for the optimisation of intralogistics and the supply chain will provide plenty to talk about, as always. So use the opportunity to get the most recent information at first hand. PSI Logistics looks forward to meeting you in the Havana Lounge in the Tiergarten 1 room of the InterContinental Hotel at the German Logistics Congress in Berlin. 

PSI Logistics GmbH  
Phillip Korzinetzki  
Marketing Manager  
Phone: +49 231 17633-280  
p.korzinetzki@psilogistics.com  
www.psilogistics.com

PSI Logistics

**Havana Lounge**

Kontakt- & Netzwerkpfege auch in diesem Jahr wieder in entspannter Atmosphäre. Wir freuen uns auf Sie!

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33. DEUTSCHER LOGISTIK-KONGRESS  
19.-21. Oktober 2016

PSI 

Software for Logistics Industry Leaders

Event: Aachen practical forum on 20/21 September 2016

## Digitalisation and connected e-mobility

As part of the strategic commitment of PSI Automotive & Industry GmbH, the European 4.0 Transformation Center is organising the practical forum “Experience Digital Transformation”. On 20/21 September 2016, top-level managers as well as departmental and section heads will be meeting at the Aachen Eurogress and at the RWTH Aachen University Campus to define transformation programmes and discuss ideas for digitalisation.

**D**igitalisation determines the future viability of products, processes, production sites and business models. PSI is one of the major technology partners of the European 4.0 Transformation Center and e.GO Mobile AG, the Aachen electric vehicle startup. With a comprehensive digitalisation strategy and highly iterative development processes, the company produces particularly cost-effective prototypes and pilot production series—quite in the spirit of Industry 4.0.



Verification of exterior design and Bosch drive train in the rolling chassis of the e.GO Life electric car.

The first day of the practical forum will focus primarily on networked electric mobility. e.GO Mobile AG will serve as an example of the intertwining of company, product and digitalisation strategies in planning and implementation. In addition to the presentation and site visit at e.GO, there will also be breakout consolidation sessions with examples of agile product development and a digital development platform, Industry 4.0 in production and C-item logistics, new business models with digital services, as well as car-to-cloud and innovative apps.

On the second day, the discussions will extend to cross-industry experience with digitalisation and Industry 4.0 from the various perspectives of the partner companies enrolled in the European 4.0 Transformation Center at RWTH Aachen University Campus.

### Interesting keynote speeches provide information on practical examples

The framework for the practical forum will be provided by cross-event keynote speeches of the two Aachen electric-vehicle pioneers—Professor Günther Schuh (Director at the Ma-

The conference programme and registration page can be found at [www.praxisforum.e4tc.de](http://www.praxisforum.e4tc.de)

chine-Tool Laboratory (WZL) at RWTH Aachen University and CEO of e.GO Mobile AG), and Professor Achim Kampker (Business Area Manager of Electric Mobility at Deutsche Post DHL)—on the topics of production of the future and pilot automobile series. Further keynote lectures by Professor Henn and Dr. Wittmann of BMW will cover Factory 4.0 and international state-of-the-art plants. ☉

PSI Automotive & Industry GmbH  
Dolores Schmidt  
Marketing Communications  
Phone: +49 30 2801-2130  
[dolores.schmidt@psi.de](mailto:dolores.schmidt@psi.de)  
[www.psipenta.de](http://www.psipenta.de)

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**IT& Business**

04.–06. Oktober 2016  
Messe Stuttgart

News: PSI Group awarded ISO 27001 certification for information security

## High security standards implemented

The PSI Group has been awarded DIN ISO/IEC 27001 certification in accordance with information security management system requirements. Achieving the standard certifies that the Group's central infrastructure has implemented high security standards that also meet the requirements of critical infrastructure operators—an important customer group for PSI.

As part of the 2015 transition to Group certification, PSI AG and, in particular, several business units in the field of critical infrastructures were awarded certification. The scope of certification includes the development and operation of control systems and software solutions for providers, industry and infrastructure operators as well as the performance of ancillary

services. Plans to expand to further business units are set for 2017. Group certification is based on the certification first achieved by PSI subsidiary PSI Logistics GmbH in 2013, which was simultaneously renewed.

### Privacy, integrity and availability

Amongst others, the information security management system tested



ensures PSI system and data privacy, integrity and availability. The successful audit was carried out by TÜV SÜD Management Service GmbH. The PSI Group has also been certified according to quality standard ISO 9001 since 1994. 

#### PSI AG

Bozana Matejcek  
Corporate Public Relations  
Phone: +49 30 2801-2762  
bmatejcek@psi.de  
www.psi.de

## EVENTS

[www.psi.de/en/events](http://www.psi.de/en/events)



13.–14.09.2016 Dortmund, Germany	Future congress logistics— 34 <sup>th</sup> Dortmunder conversations	PSI Logistics
20.–21.09.2016 Aachen, Germany	Practice forum digital transformation Eurogress Aachen	PSI Automotive & Industry
20.–22.09.2016 Moscow, Russia	CeMAT Russia	PSI Logistics
20.–23.09.2016 Berlin, Germany	InnoTrans	PSI Automotive & Industry
04.–06.10.2016 Stuttgart, Germany	IT & Business PSI on the VDMA booth	PSI Automotive & Industry
08.10.2016 Aschaffenburg, Germany	Job path kompass Aschaffenburg	PSI Logistics
19.–21.10.2016 Berlin, Germany	33rd German logistics congress	PSI Logistics
10.–12.11.2016 Stuttgart, Germany	30 <sup>th</sup> annual PSI <i>penta</i> user convention (IPA)	PSI Automotive & Industry

## IMPRINT

#### Publisher

PSI AG  
Dirksenstraße 42–44  
10178 Berlin (Mitte)  
Germany  
Phone: +49 30 2801-0  
Fax: +49 30 2801-1000  
produktionsmanagement@psi.de  
www.psi.de

#### Managing Editor

Bozana Matejcek

#### Editorial Team

Pascal Kätzel, Phillip Korzinetzki,  
Annett Pöhl, Dolores Schmidt

#### Layout

Heike Krause

#### Printing

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# PRODUCTION manager

**PSI Aktiengesellschaft für  
Produkte und Systeme der  
Informationstechnologie**

Dircksenstraße 42–44  
10178 Berlin (Mitte)  
Germany  
Phone: +49 30 2801-0  
Fax: +49 30 2801-1000  
[info@psi.de](mailto:info@psi.de)  
[www.psi.de](http://www.psi.de)

**PSI** 