Issue 01 | 2018

be top

MAGAZINE OF THE FRIEDHELM LOH GROUP

~~Can~~ the best *can* be *even* better ~~?~~

System perfection

Dear readers,

In our ever-changing world, standing still can only mean one thing – going backwards. To be and remain future-proof, you have to at least keep up, and if possible, take the lead. The megatrend of digitization is unstoppable. It is in full swing and is having a huge influence on every area of business. In this age of globalisation and digitization, it is therefore essential to be fully committed to progress and push forward with innovations.

Progress and innovation, striving for perfection and setting standards have all been defining features of our group since it was founded in 1961. As a result, you – our customers and partners – can expect us to continue to lead the way in the future. We will be investing over 500 million euros in state-of-the-art production technology over the next few years. The global transformation of the Rittal plants towards Industry 4.0 is already well underway. We are also laying down a marker at Stahlo by constructing a new facility. This will make production an integral part of a digitized value chain from customer to customer – with all the benefits to you in terms of speed, quality and global availability.

This value proposition is an expression of our desire to achieve perfection and can also be seen in the new development of our VX25 large enclosure system. Your suggestions and the insights you gave into your daily challenges provided us with valuable guidance.

The “VX25. System perfection.” is the first enclosure that meets every requirement of the entire value chain for control and switchgear manufacturers. It shortens throughput times in engineering and assembly, reduces complexity, and is a valuable element in the megatrend of digitization. We are proud and thankful to be able to celebrate the premiere of our innovative enclosure with you on 23 April at Hannover Messe 2018.

Discover the story behind the development of the VX25 and successful practical examples in the new “be top”. I hope it provides a valuable source of inspiration!

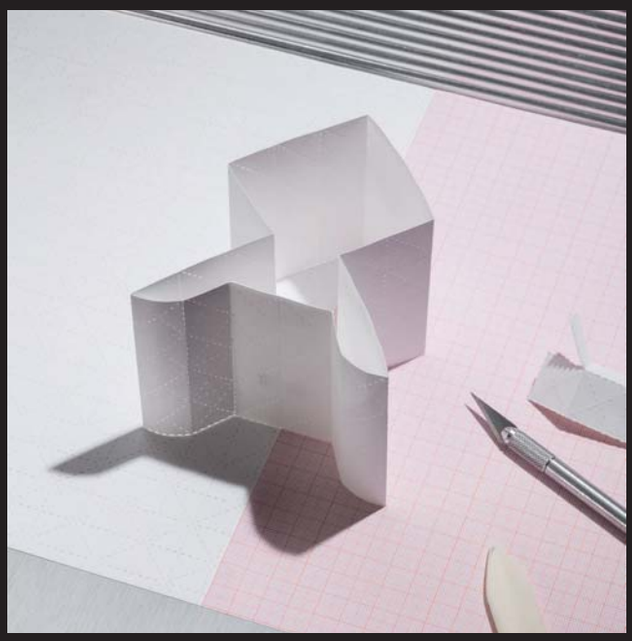
Yours,

Professor Friedhelm Loh

Professor Friedhelm Loh
Owner and CEO of the Friedhelm Loh Group

Contents

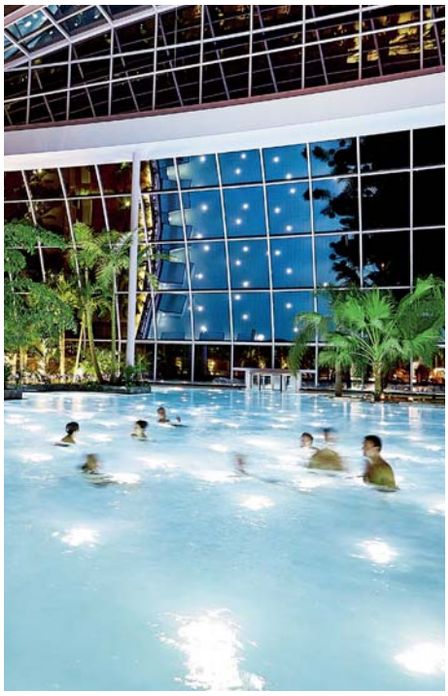
COVER STORY



EXPERTISE

COMMITMENT

EXPERIENCE



STANDARDS

Your opinion matters

Do you have any questions, suggestions, praise or criticism about the current issue?
Simply e-mail the editorial team at:
betop@friedhelm-loh-group.com

Top performance on the high seas

Approximately two thirds of the Earth's surface is covered with water. Nowhere is that clearer than on the three huge oceans that encapsulate land mass around the world. And yet humankind has only researched and explored a tiny proportion of the Earth's seas. To help change that, Canadian company **Aspin Kemp and Associates** develops energy and drive technologies that are also suitable for maritime applications. The company, established on Prince Edward Island in 1996, pursues its aims with the aid of TS 8 enclosures from **Rittal**, primarily due to the comprehensive certification they offer. Thanks to the high level of standardisation and flexibility of the Rittal solution, customers – particularly those in the very price-sensitive oil and gas market – benefit from low maintenance costs, excellent reliability, energy savings and low emissions.

www.aka-group.com

SNAPSHOTS

A passion for detail

Juicy ossobuco, creamy risotto alla Milanese or tender vitello tonnato – there is hardly a country in the world that celebrates the joy of eating good food as much as Italy. To make sure that their visitors are able to taste “la dolce vita” as part of their experience, many professional Italian chefs rely on electrical appliances from **Electrolux Professional**. The company’s dishwashers, stoves and steam ovens are also used in hotels, bars and restaurants all over the world. When designing the electrical components of its products, Electrolux Professional in Italy uses software from **Eplan**. The end result is a high level of standardisation and automation thanks to the use of macros and improved precision from using digital prototypes.

www.professional.electrolux.com

SNAPSHOTS

Ordered, packed and delivered

Global e-commerce has experienced a long-term growth trend for years. Last year alone, retail e-commerce sales worldwide amounted to more than a trillion euros. Whether books, movies, clothing or electrical appliances: Everything must go smoothly in the logistics centres so that the desired items are delivered to the customers as quickly as possible. That is why **online retailers** are favouring prevention rather than reaction. For instance in China, Europe and the United States, thousands of cooling units in the logistics centres ensure a fail-safe cooling and a trouble-free process. The maintenance and servicing of the equipment is provided by **Rittal**.


ACK &
N LINES
5 - 8
Rebin Medium
455
Rebin Medium
131
Rebin Medium
231
AREA READINESS

Limits are just in your head

Global. Energy, mobility, automation – customers around the world rise to their challenges with the products and solutions from **Friedhelm Loh Group** companies.

UK

Automation for all industries

The automation of production processes in the rail, automotive, aviation and packaging sectors is what QM Systems Ltd does best. The company, based in **WORCESTER** recently started using Eplan, and as a result has accelerated their electrical engineering processes, sped up procurement and improved manufacturing processes in the production of customised plants and machinery.

USA

Full of energy

For more than 200 years people have been using batteries as a power source – in flashlights, children's toys and computer mice. To protect batteries as they make their way from production facilities to the customer, Koch Pac-Systeme GmbH supplies blister plants for manufacturing battery packaging to a US packaging specialist in **GEORGIA**. And the company makes good use of TS 8 enclosures, chillers, bus housings und cooling units from Rittal.

SOUTH AFRICA

Playing it safe

Whether it is car insurance, health insurance or education insurance – for each and every one of the almost 56 million inhabitants of South Africa insurance companies offer policies. The insurers themselves also prefer to play it safe: in the data center of a company within the group in **SANDTON**, TS IT racks from Rittal are used.

INDIA

Service safeguards production

With ever new technologies tire producers want to make roads and traffic safer. To ensure more reliability at the company's production facilities of a tire expert in the Indian **MEERUT**, services have recently been provided by Rittal. The predictive maintenance of cooling units and IT racks ensures the customer a higher fail-safeness and efficiency of production.

JAPAN

Going with the flow

14 production plants, 157 service sites, 79 countries: DMG Mori is one of the world's leading manufacturer of machine tools. The company has been enhancing international cooperation since 2015 with the aid of a standardised engineering platform. The newly rolled-out Eplan CAE software delivers standardised processes that are more efficient. For example, engineers in **TOKYO**, Japan, can easily pick up and carry on CAE projects kicked off by German colleagues in **BIELEFELD**.

SWITZERLAND

Through the mountain

There are more than 30 mountains over 4,000 metres high in Switzerland. While Hannibal had to drag his army up and over them, tunnels make travelling easy today. One of them is the **BÖZBERG TUNNEL**. To improve safety standards at this veteran example of mountain engineering, the Swiss Federal Office for Transport (BAV) is refurshing the 3,702 m-long tunel, using TS 8 enclosures from Rittal.

System perfection

A plan. A study. A race. The development of the new VX25 large enclosure from **Rittal** has been extraordinary. The milestone five-year R&D story shows that it's much more than just an enclosure.

Text: Ulrich Kläsener

A CHANGE OF PERSPECTIVE

The perfect enclosure doesn't spring straight from the drawing board or lab, but from the workshops of the international customers that Rittal serves. Ultimately, the actual requirements for an enclosure in the age of digitization and Industry 4.0 depend on the day-to-day challenges associated with it. The field study proved to be an eye-opener for the Rittal staff, who returned to their office with more than 150 specific requirements for the VX25.

1

Rittal plant, Herborn, summer 2012

When it comes to the bestseller of a company with a headcount of 10,000, it's time to look to the boss. In April 2012, Professor Friedhelm Loh himself issued a clear order: "We need to develop a new enclosure for our customers. The best there is." Sitting at the opposite side of the desk was Dr Thomas Steffen, Managing Director Research and Development, who understood the implications of the biggest challenge for over 15 years. "There couldn't be a more significant project at Rittal. The large enclosure is our system platform, our core, our foundation."

DR THOMAS STEFFEN
Managing Director Research and Development

Industry 4.0 as a driving force

The mind starts to buzz. Where do we start? Evolution or revolution? What constitutes the best? What do switchgear engineers need? Only one thing is clear at this point, with the spectre of Industry 4.0 having shrouded the market for a year – the new large enclosure from Rittal will have to be 100% Industry 4.0-capable. That's an absolute must. After all, only a combination of actual enclosure and its digital twin will satisfy all digitization needs, from online configuration and engineering to assembly, automation and maintenance. "The new reality" is how Steffen refers to the highly efficient fusion of real and physical workflows in the product lifecycle. "Some 20 years ago, it wasn't a big issue in enclosure building, but an enclosure isn't fit for the future without consistent, end-to-end data or software-based rules." As designer and architect Ludwig Mies van der Rohe put it: "It's more difficult to make a good chair than a skyscraper."

Back to the roots

The need to go back to the heart of it all motivated the Rittal developers to study practical needs between 2012 and 2014 – and that produced the ideal answer to the problem. Indeed, Steffen did not kick off the search for the perfect enclosure at the drawing board or in the lab. "Back to the roots – that was the solution. Before we could let our team get on with developing the new enclosure, we had to revisit our customers' workshops to find out what challenges they are facing right now and analyse the issues." Rittal worked with the Munich-based institute PMO to launch a wide-ranging field study. Researchers were sent to ten industrial companies in Germany, eight in the USA and six in China – with small and medium-sized companies well represented – and spent three days at each company documenting everyday working life in writing, pictures and videos.

No compromises

Dr Steffen recounts the study: “The user analysis was an eye-opener. In some cases, we spotted problems that the customers themselves hadn’t yet identified.” The end result was a total of 150 specific requirements for the new enclosure, which Rittal added to with findings from the customer advisory council that was also involved. “We didn’t give up on a single one of the main points during subsequent development work.” So, what, for example, was taken into account? “Simplified assembly, a 25 mm pitch pattern, added flexibility in baying, higher load capacities, fewer accessory parts and an extremely stable base section.” The usability study eradicated any lingering doubts about the strategic direction for the new large enclosure. The market needs an enclosure that immediately reduces throughput times in engineering and assembly, minimises complexity in the wake of batch size 1 and slots neatly into the megatrend of digitization.

Nurture and demand

However, there was a brief pause for reflection before the mantra of “more digital – simpler – faster” was transformed into actual design work. “It was a brilliant move,” says Steffen, referring to Professor Loh’s decision to set three development teams against each other. There was the research and development team based at the Herborn headquarters, the team from the Rittershausen plant and a team put together from an external development company based in southern Germany, which was supported by two well-known Rittal veterans, Heinrich Styppa and Hans-Jürgen Graf. The three teams worked in complete isolation from each other on the same primary task – to design the perfect profile for the best enclosure of all time. “They were all given an in-depth induction in the findings from the field study, but worked entirely autonomously and with no design limitations.”

For a good three months, the two Rittal teams were released from all other duties and plucked out of their usual workplace, timetable and even headspace. “The telephones went, e-mails were diverted, existing projects were handed over – all that was assigned to other people.” The new offices became incubators, like those normally associated with start-ups in the tech sector – it was all about shaping the future with cool heads and passionate hearts. Dr Steffen explains: “Of course, the development teams had to find their feet first – you can’t force that. But then they were off. They fired each other up, fuelled each other and encouraged each other. When things really got going, they poured out every last detail of every idea that had collected in their heads over 20 years of enclosure engineering. Of course, everyone was constantly wondering what the other teams were doing. Then again, uncertainty can produce a lot of new ideas.”

The right path

Two profile designs from each of the three teams – which together had produced more than 200 – were put before a judging panel in October 2013. Professor Loh set out the primary criterion. “It comes down to functions and customer benefits – which solution implements the most?” The new profile from the Rittal research and development team won through – much to the delight of Steffen: “We were vindicated – it takes years of experience to develop very, very good enclosures.” He was impressed by the dynamic of the five-year development story behind the VX25: “We would do it exactly the same way again.” ■

DESIGNING A NEW PROFILE to satisfy all customer requirements was an ambitious target and the developers withdrew into their offices for a full three months to achieve it. During the process, 20 years of enclosure expertise was incorporated into six different designs that went in front of a judging panel.

FAILURE was always a risk for the developers. After all, any large enclosure concept stands and falls by the profile. If the profile is less than ideal, there are consequences for the stability and security of the enclosure. That's why the developers went back to the very basics.

Interview

Delving into the Bermuda Triangle

DR ELKE DEUBZER
Head of the **PMO Usability-Engineering & Organisations-Entwicklung institute**

Watched. Listened. Learned. Before developing the new VX25 large enclosure, Rittal commissioned a year-long field study on three continents. Munich-based institute PMO Usability-Engineering & Organisations-Entwicklung conducted the study. Interview: Institute director Dr Elke Maria Deubzer.

What is "usability"? It describes the extent to which a product has been tailored to its users, their tasks and the wider context. That's the 'Bermuda Triangle' that we delve into, on a scientific level.

You started by visiting control and switchgear manufacturers in Germany with a team of usability experts, psychologists and anthropologists – what exactly did you do at these companies? We carried out user-task-context analyses. That involves going on-site to record specific data regarding users and their knowledge, preferences and motives. We also observe their tasks, the objectives of their activities, specific contextual conditions and usage scenarios.

So you watched over the shoulders of enclosure fitters? We observed and interviewed everyone who works with enclosures in the relevant companies. Everything was documented in writing and sometimes with photographs and videos, too. But it wasn't just enclosure fitters.

Oh? Unlike a consumer product, an industrial product has a whole range of user groups. In the case of an enclosure, that includes engineers, logistics workers, fitters, wiring technicians, testers, commissioning staff, maintenance workers, etc. On top of that, there are the people who decide what the company buys, such as technical procurement officers, managing directors and asset managers.

It sounds complicated That's why usability engineering is the best way to get at the user. Usability goes much further than what we understand under the term "user experience", as it also factors in tasks and context. To investigate these areas, you really need to understand how people work on a scientific level – it's this expertise that guides you in the right direction.

So what did you find out? Without wanting to go into details, some of our findings were unbelievable. Even with a product as supposedly simple as an enclosure, the study enabled us to expand what we know exponentially. We got the full gamut of reactions, from 'wow' to 'genius'. That goes for the staff in the companies, too, as we gave them an opportunity to really reflect. After all, they don't observe themselves and they can't always say what their requirements are.

But you can? There are qualitative research methods for that.

Weren't the "test subjects" distracted by having an outsider there documenting everything in finite detail? Isn't there a risk that what you're observing is not what actually happens under normal conditions? We have empirically tried-and-tested tools and approaches to minimise disruptive factors such as the Rosenthal effect, selective perception and the halo effect. These include the researcher's clothing and language, expert practical skills in recording data and even the period of time that we are on site. You often find it takes two to three hours for workers to get used to the situation.

Your institute carried out three in-depth analyses at three companies in Germany – then teams of researchers from Rittal were sent to seven companies in Germany, six in China and eight in the USA. Why? Those were studies to check the findings in other markets and cultures. Ultimately, the large enclosure from Rittal is an international product. Of course, we provided the Rittal staff, which included preliminary developers, engineers and product managers, with training and guidance in the scientific methodology beforehand.

What do you actually get from a user-task-context analysis? After documentation and evaluation, the focus shifts to 'requirements engineering' and development work on the potential for improvement and innovation. If I understand the requirements exactly, the R&D department gets a robust guide for its own development work.

2

Supplier plant, Schopfheim, November 2015

Things were serious. Shortly after eleven in the morning, three years of development work hung in the balance. It looked like the test run for the profiling of the frame section could end in disaster: "Everything was going well up until the system punching," recalls Heiko Holighaus, Vice President Research and Development at Rittal, "but then the material started to crumple. We couldn't get a reliable laser weld seam. It just couldn't be done cleanly." Hundreds of designs for the new VX25 enclosure, countless simulations, intensive user research, blood, sweat and tears – had it all been for nothing?

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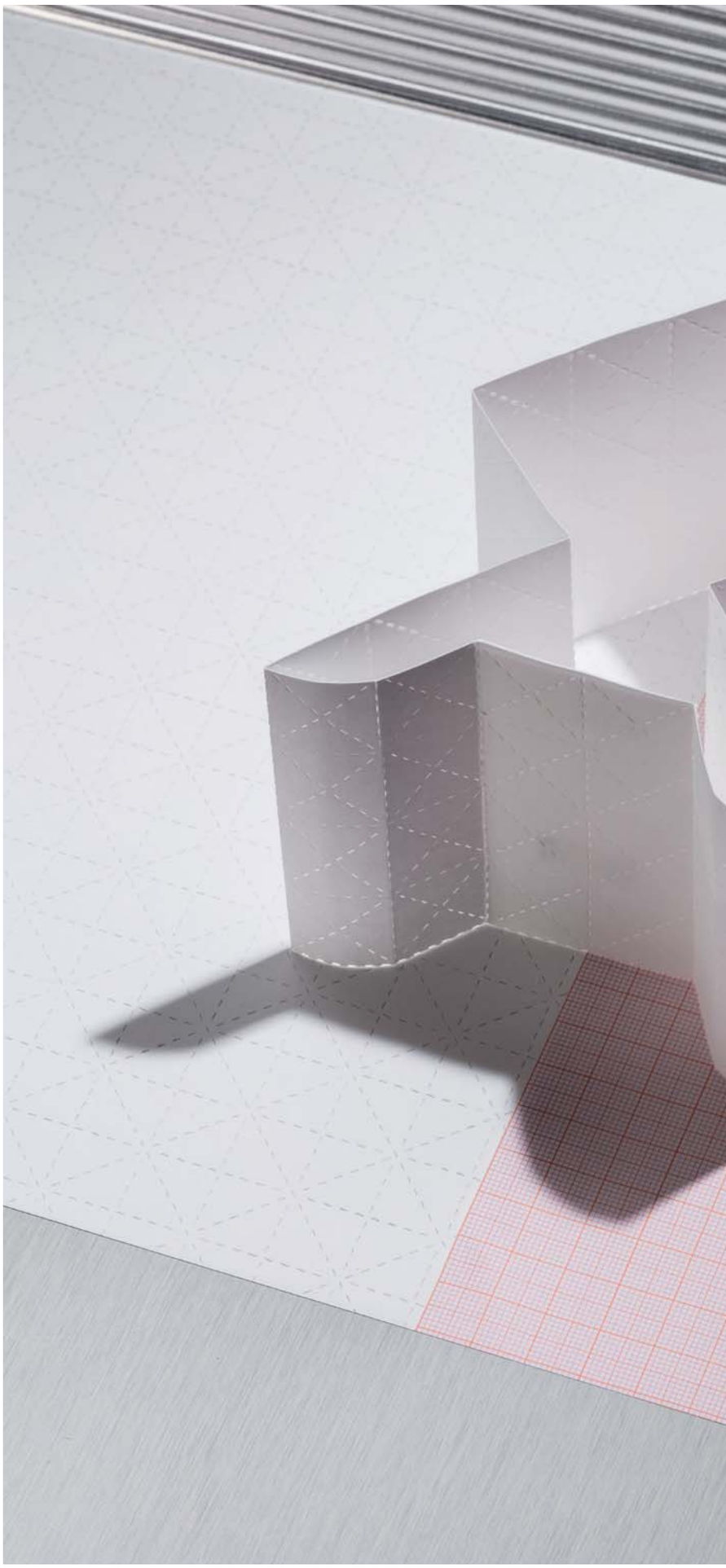
1 **HEIKO HOLIGHAUS**
Vice President Research and Development at Rittal

2 **FRANK HIMMELHUBER**
Executive Vice President Research and Development at Rittal



PERFECT SYMMETRY for the perfect profile. It looks great, but it posed a major challenge when it came to production. Right when the team thought they were on the home straight, the weld seams had to be reversed 180°.

All or nothing?

A sense of foreboding hung heavy in the air – exceptionally, everything came down to this. “Any large enclosure design stands and falls by the profile – it’s the most technologically demanding part,” explains Frank Himmelhuber, Executive Vice President Research and Development at Rittal. “To a large extent, the profile determines the installation space, engineering and assembly efficiency, expansion options, stability and thus security, flexibility in the customer workshop, etc. That means, if the profile fails, we have to start over from scratch.” In the end, it didn’t come to that.

Turned 180°

The Rittal engineers put their heads together and went through all conceivable options over months, continuing to work undaunted on the prototype all the while. There was nothing that could be changed about the symmetrical profile itself, so a solution had to be found in the production method. In the end, one small stroke of genius broke the stalemate – the weld seam was reversed exactly 180°. Holighaus explains: “We turned the profile 180°, so we were starting profiling on the inside and then welding on the outside instead of the other way around.” Time to take a deep breath. A new test run was arranged for the modified plant. And it worked. Actually, the tests for stability and rigidity returned top results. Shortly afterwards, the first VX25 sample enclosures were on their way to their pilot application with carefully selected customers.

Just an enclosure?

“At times, it felt like a roller coaster ride. Then again – ‘no pain, no gain’. Projects like that are why you become a developer.” Himmelhuber and Holighaus are very familiar with the highs and lows of product development, which at first glance needs to reconcile complete opposites such as total design freedom and engineering constraints. What’s more, dramatically improving simple things is one of the pinnacles of research and development. “An enclosure is always going to be an enclosure. It’s never going to fly,” Himmelhuber continues: “Reverse-thinking the development and scientifically investigating the processes beforehand with the customer gave us precisely the motivation we needed. The same applies to the work done by the three development teams – start separately then consolidate results and bounce off each other.” ■

THE ENCLOSURE may not be able to fly – but the VX25 is still setting new standards on the market. The enclosure matches the way the customer thinks and works – in both functions and processes.

3

Rittal Innovation Center, Haiger, autumn 2016

They are referred to as design thinking, open innovation or lead-user methodologies. Think tanks in America have poured time and resources into researching the conditions that need to be met for new ideas to flourish. The biggest common factor is that innovation doesn't come from silent contemplation but rather from interaction and discourse with carefully selected users. The determination to optimise the usability of the new VX25 large enclosure also led Rittal directly to the workshops of its top customers. Members of the customer advisory council have supported the development of the VX25 from the very start – as sparring partners, sources of inspiration and pilot users. Here is a brief summary.

"In terms of interior installations, the greatest benefit is that you can arrange the components as needed – there are many possible combinations. The new enclosure is better than its predecessor, the TS 8. It's easier to assemble, especially in combination with the plinth."

Thomas Frink
Managing Director – **KSV Koblenzer Steuerungs- und Verteilungsbau GmbH**

"The new enclosure's strong point is its components – they greatly improve productivity for switchgear manufacturers. Being part of the development process for a new product was a fantastic experience. I am delighted that so many of our suggestions as switchgear manufacturers were taken on board. What really impressed me is that you need no more than two tools to complete the enclosure."

Heinz-Josef Schmitz
Head of Switchgear Manufacturing and Technical Services – **Blumenbecker Group**

"The greatest strength of the new enclosure system is its simplicity. I believe this is a step in the right direction: on the one hand, as a way of driving innovation, and on the other, as a way of reducing complexity, for example in terms of accessory parts. Being involved in development from the outset was a huge benefit for us, as we could influence the enclosure's usability and interior installation."

Olaf Günther
Head of Systems Solutions – **Siemens AG, Digital Factory Division, Werk für Kombinationstechnik Chemnitz (WKC)**

"The new enclosure is an improvement on the previous model; it is much more versatile. Its greatest strength is that you can install a large number of interior components, but the number of accessory parts has been reduced."

Andreas Ripploh
Managing Director – **Ripploh Elektrotechnik GmbH**

"The new enclosure's greatest strength is its accessories – they are fewer in number of parts, but richer in functionality. The simplicity of the enclosure's components is a huge advantage when it comes to assembly."

Holger Mrzyglodzik
Project Manager – **Schubs Steuerungstechnik GmbH**

4

Rittal plant in Haiger, December 2017

A firm handshake and a friendly word – the presentation of the new VX25 in the brightly lit Rittal Innovation Center started well. "Come with me." Did those words reveal just a tinge of pride in the company's achievements? Matthias Müller, host and Director Product Management Enclosures is clearly confident in what Rittal can offer. However, the tour through the halls of Industry 4.0 processes for control and switchgear engineering would have to wait for now. It was time to unveil the star attraction – the new VX25 large enclosure from Rittal.

MATTHIAS MÜLLER
Director Product Management
Enclosures at Rittal

Behind the door

A pretty unremarkable light grey door separated the visitors from the object of their attention. Were it not for the security team scrutinising visitors' accreditation, you could be forgiven for thinking it was just a door to the warehouse. However, that's only partly true. Behind it was indeed a storeroom, but one charged with an atmosphere of anticipation. There it was, in the centre of the room, draped in a covering – the VX25. Surely though, it's just an enclosure with a door and a base. It's a good example of industrial design, you can tell it's new, but it's pretty unimportant, right? "Not at all," smiles Müller. Eyes automatically flick from the freshly printed posters on the wall that showcase the new features and functions of the VX25 to the new enclosure itself. OK, the tried-and-tested two-level approach has been retained, the mounting plate is still there and all the key functional and connection dimensions are the same. "We very deliberately only reworked areas where it would benefit customers. We largely left well-established, proven elements alone so that it's easier for our customers to make the switch." A look at the brochure confirms all that. So what exactly is new about it then? Müller explains: "What's new is that the enclosure 'ticks' the way the customer thinks and works – in functions and processes. Those are the big levers."

Workshop know-how

One example is the fact the VX25 can be accessed from all four sides: "Components can now be fitted to the outer mounting level from the outside, which is a huge practical advantage. That easily affects 40 percent of our customers." This one change saves 30 minutes compared to conventional assembly procedures. The same applies to the new feature that allows users to install mounting plates from the rear. That's an argument that wins over switchgear engineers around the world, particularly when it comes to installing very heavy weights. Talking about the rear, an extra 20 mm of installation depth (through accessories) delivers more space. That is important when it comes to meeting the ever-rising demand for higher packing densities. To optimise our customers' value chain, the flat parts of the VX25 feature a "unique" QR code that ensures the components can be matched up with the relevant items on bills of materials in the customer's ERP system. The flat parts can now be tracked throughout the entire workflow and allocated to the correct machining programs, machining times can also be recorded and much more besides. Far more straightforward and easier to engineer and install – for Müller, these benefits are primarily down to the reduced complexity in the range of parts, which Rittal achieves by using multifunctional components. "In the case of the VX25, we were able to deliver all the functions of the TS 8 with far fewer accessory parts and also create new functions and added value." The new "automatic potential equalisation" is impressive evidence of the system platform credentials that the VX25 boasts. As on the TS 8, the fixings for the roof, rear panel, side panels and gland plates ensure reliable contacts. Another new development means that, in future, customers won't need to use earth straps when fitting live Rittal components such as fan-and-filter units and climate control units to these flat parts.

No tools

Returning metaphorically to the customer's shop floor, Müller points out the new door handles. Thanks to the snap-on system, the handles can be changed twice as fast as before: "Just take hold, press on and job done. In the past, the handle had to be fitted with screws." Adhesive also had to be used, specifically for the baying seal, but now it just pushes into place. What's more, thanks to the new screw connection that runs on the direction of baying, it's even easier to create any combinations on all sides. Back to the door: In future, customers won't have to machine the door for an 180° hinge installation. "Drilling eight holes, deburring, painting – until now you needed about 30 minutes per door to move them 180°." Now door installation is child's play: "It can be taken off its hinges and put back on easily, like a door in the home, and when it's shut it is automatically secured."

A solid base

A glance at the clock reveals that the product presentation should have finished 30 minutes ago. "But I still have to show you the new base, which fits anywhere." The new base combines all the functions from the TS base and the Flex-Block base/plinth system in one solution and can do much more than before. Even enclosure accessories can be built into the base. For example, baying brackets and cable clamp rails can be installed there, and cables can be simply and efficiently retained and secured via the punched sections. Not only does that save time and money, it also boosts safety. The integrated centring aid in the corner piece and the option of fixing the base in place directly from above "put an end to tricky building and tweaking work. Rapid installation, rapid use – that's what it's all about." ■

VX25. System perfection

The VX25 is the first large enclosure system capable of meeting the technical requirements of Industry 4.0 to perfection, while at the same time ensuring faster, more productive assembly. This Rittal innovation is the result of our tireless striving for MORE: more simplicity, more speed, more benefits. More than 25 registered property rights confirm the reputation Rittal has earned as the leading innovator in enclosure technology.

EFFICIENT PROCESSES

End-to-end, accurate, validated 3D data ensure a high level of planning confidence from the outset. A plausibility check in the Rittal Configuration System facilitates fast, error-free configuration of products and accessories.

REDUCED COMPLEXITY

In the VX25, we have managed to successfully replicate all the functions of the predecessor model TS 8 with far fewer accessory parts, while creating new functions and adding value. A consistent 25 mm pitch pattern across all levels and between enclosures has helped to significantly reduce the number of individual parts – for example, 40 per cent fewer punched sections/rails.

IMPROVED ACCESS

The VX25 is accessible from all four sides, because components can now also be fitted to the outer mounting level from the outside. This saves 30 minutes compared with conventional assembly. The same applies to the new option of installing mounting plates from the rear

SIMPLE INTERIOR INSTALLATION

Fast assembly is facilitated by complete symmetry on all vertical and horizontal enclosure sides. The installation depth can also be increased by 20 mm with optional accessories. Multiple mounting plates can also be installed in one enclosure.

TOOL-FREE INSTALLATION

The simple, tool-free assembly of the handle system reduces assembly time by 50 percent. Similarly, doors can also be fitted and removed without the need for tools.

MORE FUNCTIONS

Even enclosure accessories can now be built into the base. For example, baying brackets and cable clamp rails can be installed there, and cables can be simply and efficiently retained and secured via the punched sections. Not only does that save time and money, it also boosts safety.

“Innovation? It’s a back-breaking task”

Interview “When can we buy it?” The initial feedback on the crowning glory of the Rittal portfolio – the new VX25 – has been impressive. Test users are talking about the best enclosure they’ve ever laid their hands on. be top spoke to Professor Friedhelm Loh, Owner and CEO of the Friedhelm Loh Group about the background to the years of research and development work that have culminated in the VX25.

Text: Ulrich Kläsener

You had three separate teams of developers working on the project for the new VX25 large enclosure at the same time. Did that work out well? Looking at the speed of development, the dynamics and the results, I’d say yes, it absolutely did. We’ve been able to register numerous patents on the back of this work. They’ve either been implemented in the VX25 or are ready for use in more innovations.

Innovation is the epitome of change. That also affects in-house R&D processes. How has Rittal overcome the barriers that come with ingrained habits and mindsets? Well, we based our work strictly on the current and future needs of our customers. We asked ourselves which Rittal solutions our customers could use now and in the future to become more effective and, ultimately, more efficient. That is the all-important question. To find the answer, you need to look beyond your own four walls.

What does that mean? It means you start off focusing on what your customers worldwide actually need and only then, at the end of that process, turn to the product. Of course, when it comes to product development, transferring all that into practical application is a pretty big task. The most important parameter is our customers’ success.

Rittal pulled out all the stops for that with the new VX25. It started with field studies at control system and switchgear engineering companies around the world. What do the results mean for your staff in Development? Innovation is a back-breaking task. You have to be clear about that. Besides the expertise of the workforce, it requires a curiosity for new things and the necessary capacities – first and foremost courage, determination, structure and an iron will to succeed.

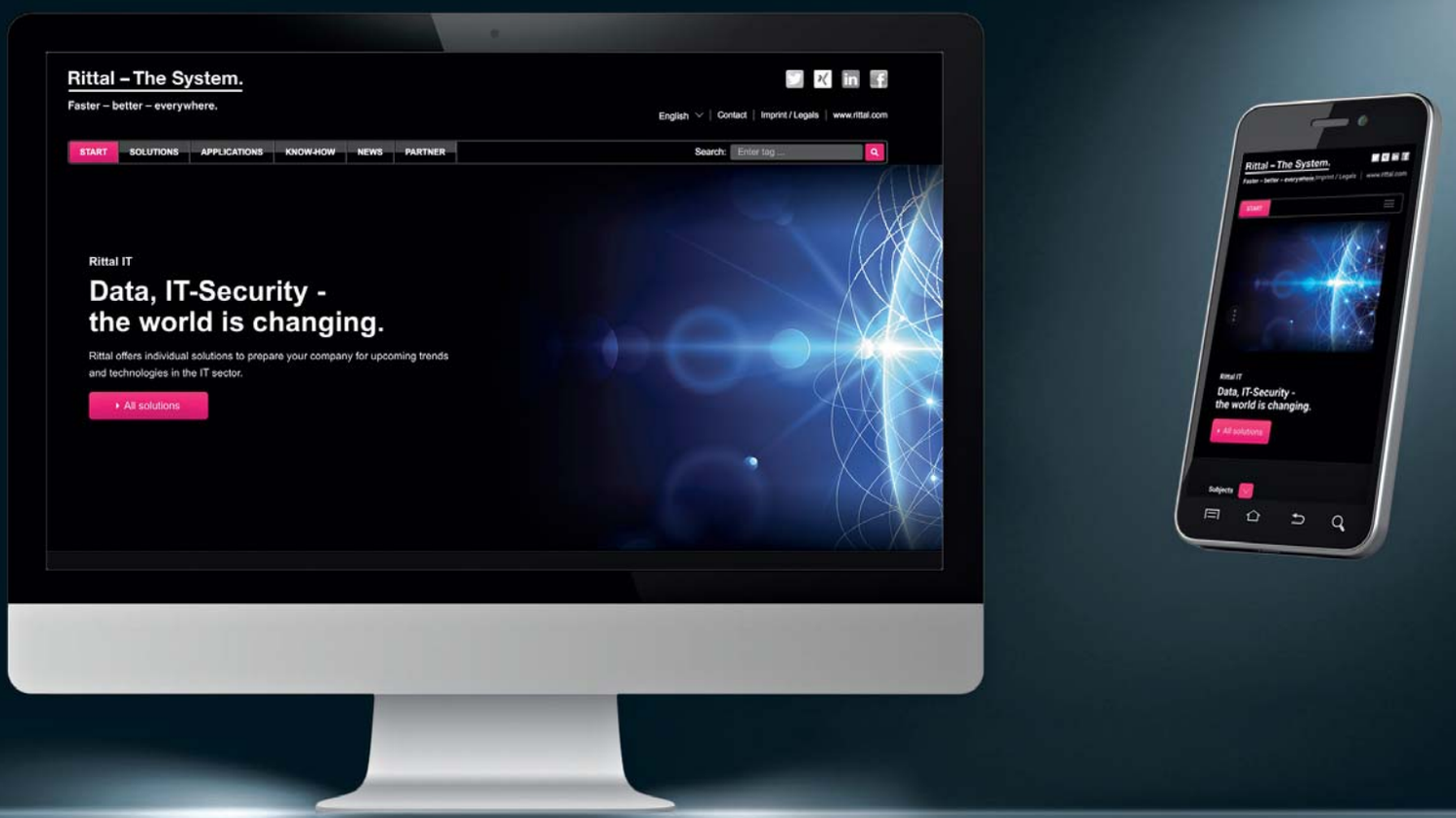
What do you mean by “courage”? We need to have the courage to be open. Things that are still classed as innovative today will likely be out of date tomorrow. You’re never going to get far with tunnel vision, a me-first outlook and entrenched structures. You need to be tenacious in regularly questioning established approaches and the accepted wisdom in your plant.

That leaves determination and structure. Let’s take Industry 4.0. As a market leader, we have to be spot-on at anticipating megatrends like that and incorporating them consistently into products, so that our solutions are futureproof for us and our customers. That then creates genuine added value for everyone.

Progress is an integral part of the Rittal DNA. But anyone who breaks new ground surely has to prepare for uncertainties, don’t they? Every new product that is developed harbours opportunities and risks. However, any company that turns away from new ideas that make sense and chooses to rest on its laurels is taking far too big a business risk. That applies to our customers just as much as it does to us. If the R&D process is based on a sound analysis and work structure, the risks and development timeframes can be minimised.

So has the “creative corner” of days gone by run its course? Of course not. Our staff have exceptional expertise and skills. The development of the VX25 showed once again that the know-how we’ve built up over several decades of developing and manufacturing enclosures really is gold dust. Lifelong learning is no hollow catchphrase – it’s a crucial solution. The new VX25 is a shining example of precisely that. We also used scientific methods to record and analyse customer processes, brought outsiders on board to help us think outside the box and looked at completely different sectors – that is an important basis for innovation. The result is pure inspiration. ■

EXPERTISE



Answers at a glance

Big Data, the Internet of Things and edge computing – these current trends are changing industry at a breathtaking speed and for good. Rittal has launched a new IT website to present its large portfolio of solutions and demonstrate their use based on specific sample applications. “Our new IT website and our solutions expertise enable us to provide customers with optimum support in their decision-making process,” explains Dirk Miller, Executive Vice President Marketing at Rittal. Rittal provides a means for customers to communicate complex issues and specific application scenarios. This enables them to get in touch quickly and easily with the company’s experts. The website’s responsive design means it can also be accessed on the move from mobile end devices.

www.rittal.com/it-solutions

Under one roof

Customers, suppliers, politicians and associations celebrated the construction of a joint distribution centre for Rittal and Eplan in Italy on 11 December. Located in Milan's Pioltello district, the new building, covering 3,700 square metres, provides offices for 100 employees and space for numerous training and meeting rooms, ensuring rapid coordination with customers. There is another 480 square metres of space where customers can discover the solutions being offered by Rittal and Eplan. "With this new building, we are setting the trend to a modern building technology that benefits customers, employees and the environment", emphasized Marco Villa, Managing Director of Rittal Italy.

New ideas for enclosure production

How will enclosures be manufactured in the future? The Institute for Control Engineering of Machine Tools and Manufacturing Units at the University of Stuttgart examined the question in depth in a recent study. It found that wiring takes up the most time. Almost 54 hours, which is almost half of the production time, is devoted to this task alone. To accelerate this and other stages of the enclosure production process, the researchers examined the potential for automation and digitization. The results are revealed exclusively at:
www.eplan.de/study-isw

90%

less time is required for fitting the electrics if digital enclosure models are used to prepare the terminals in advance.

19

strong partners

Rittal and 18 other companies – including Siemens – founded the global user organisation for "MindSphere World" with the aim of further expanding the ecosystem of this cloud-based, open IoT platform. By continuing to develop and optimise IoT solutions, these companies want to capture new markets in the digital economy. "The broad expertise and offerings of all the MindSphere World partners open up entirely new digitization potential for users all over the world", said Klaus Helmrich, member of the managing board of Siemens AG. Further information on this association can be found at:
www.mindsphereworld.com

Award for innovation

The business magazine "brand eins" and the online portal "Statista" recently awarded Rittal the title of "Innovator of the Year 2018". "We are proud that we, as an innovative company we able to make such an impression and find our way onto the list of top performers", said Dr Thomas Steffen, Managing Director Research and Development at Rittal, proudly. This is now the third time that the two economics platforms have compiled a list of Germany's the most innovative companies. Rittal made it into the ranking for the first time. The award recognizes companies that achieve a clear competitive advantage through innovative developments.

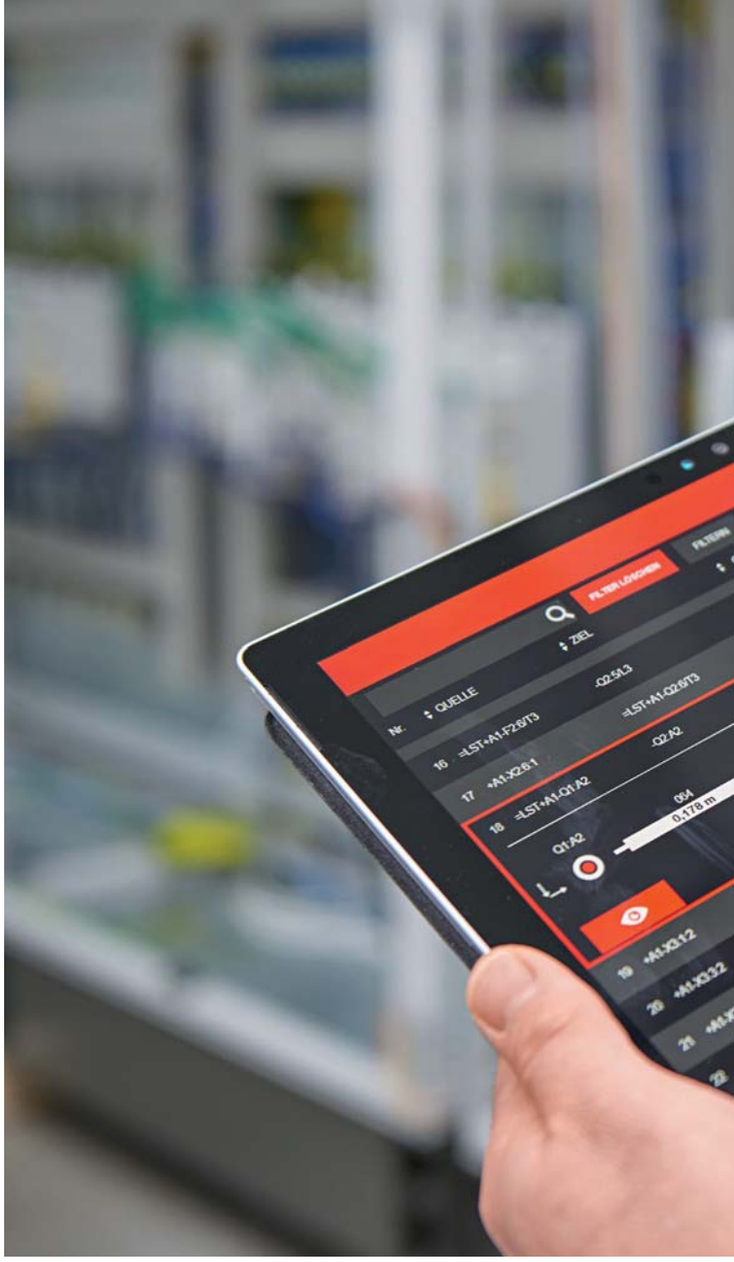
Quickly and easily configured

As the Internet of Things is developing rapidly, it will be imperative more than ever before for companies to adapt their IT infrastructure. Edge data centers help to process large amounts of data near the source in real-time. For the quick, simple and cost-effective planning and implementation of Edge data centers, Rittal now offers a web-based configurator. Designed for IT solutions from two to eight racks and from 3 to 30 kW, it provides support not only in the configuration of the rack, climate control, power supply and safety components but also in the analysis of the request. Further information can be found at:
www.rittal.com/edgedatacenter

Paperless production

Digitization. For years, thick folders stuffed with printed circuit plans have been a standard feature of switchgear engineering. If the plans aren't completely up to date, it isn't long before errors start to occur. To stop that happening, and save time when enclosures are being wired, Schaltanlagenbau GmbH H. Westermann is testing **Eplan** Smart Wiring – with resounding success, as an analysis by the Fraunhofer Institute has shown.

Text: Dr Jörg Lantzsch



2

1 Making it easier to wire components: Staff can access planning data directly at their workstation. They can see all the connections that have to be wired at a glance on their tablet.

2 Thick folders for switchgear engineering? Eplan Smart Wiring makes production paperless.

3 From a manual workshop to a state-of-the-art industrial company – the digitization project is restructuring working processes and optimizing production.

1

3

Wiring enclosures without a printed wiring plan? For decades, nobody at Schaltanlagenbau GmbH H. Westermann could have imagined such a thing. "It's actually a strange state of affairs, since there are of course many down sides to a printed wiring plan," says Heinz-Dieter Finke, Technology Director at Westermann. Take a shift change, for example – how far has the worker going off shift got with the job? Which connections still need to be made? And what do all the handwritten scribbles on the plan mean? To avoid as many of these difficulties as possible in the future, the company recently started using a digital solution for enclosure wiring. It is being supported by the Fraunhofer Institute for Mechatronic Systems Design (IEM) and the German Federal Ministry for Economic Affairs and Energy. "As part of the Digital in NRW competence centre, we are on hand to support medium-sized companies with digitization," explains Robert Joppen, a scientist at Fraunhofer IEM who is helping with the project at Schaltanlagenbau GmbH H. Westermann. As part of their work with the competence centre, Joppen and his colleagues develop bespoke solutions for implementing Industry 4.0. Digitization in switchgear engineering is just one of six implementation projects, and the successes achieved in these are to be used as templates for other companies in the sector.

FROM A MANUAL WORKSHOP TO AN INDUSTRIAL COMPANY

Schaltanlagenbau GmbH H. Westermann in Minden, Germany, is typical of the many medium-sized companies that make up this sector. Established in 1983, the company employs around 70 members of staff at two sites. "We have reached a tipping point for moving from a manual workshop to an industrial company," says Commercial Director Uwe Friedrichs. Its primary areas of activity are switchgear engineering, automation technology and cable processing.

"We have optimised our production systems by expanding the production areas," explains Finke: "We've reorganised and restructured our sequences, so the digitization project fits in very well with our strategy." Finke believes that digitization taps into interesting potential in this changing market.

The question that kicked off the project was: "What does Industry 4.0 mean for switchgear engineering?" In a first step, various companies in the sector were surveyed as part of a study to identify key trends.

The entire process chain was examined, from project planning and work preparation through machining, component installation and wiring all the way to inspection and commissioning. “At around 50 per cent, wiring accounts for the largest proportion of the total outlay that goes into creating an enclosure,” points out Joppen. “As a result, it is also one of the biggest sources of potential in the company. “Naturally, this potential can only be harnessed by looking at the bigger picture for the company.”

That is why the implementation project focused on this subprocess as a part of the overall process chain. To support the rollout of the project, a committee was put together with representatives from Eplan, Phoenix Contact, Rittal, Wago and Weidmüller. The committee members brought with them expertise in components, software and processes for switchgear engineering and contributed their own practical experience to the project.

PAPERLESS WIRING

“Wiring the components in an enclosure involves a lot of manual work. When we were assessing the current state of affairs, we identified ‘paperless’ production as a possible project,” explains Joppen. In the past, wiring plans had always been printed out and given to electricians as they worked on the wiring. Each connection would be ticked off in the wiring plan as it was made in order to document progress. There are several disadvantages to this classic approach. For example, markings and notes can vary from one person to the next. That means workers taking over from colleagues at a shift change, for example, often have to start off by deciphering their workmates’ scribbles. Moreover, a printed wiring plan is only ever a snapshot of the project at one particular point in time. Changes made after the wiring plan has been printed out are not included. Also, if electricians carry out the wiring differently to the way it is set out in the wiring plan, they only document this by marking it on the printed version.

To ensure data stays up to date throughout wiring work, staff must be able to access digital – and therefore always up-to-date – planning data. At the same time, digital wiring support can be a valuable tool for making work easier. “At first, it wasn’t clear whether we’d have to develop our own tablet-based solution as part of the project,” recalls Joppen. However, market research quickly turned up the Eplan Smart Wiring solution, which offers all the desired functionalities. The software shows all the individual connections that have to be wired on one tablet. Besides the start and

25

PER CENT
faster is how quickly a trained worker can complete wiring when supported by Eplan Smart Wiring.

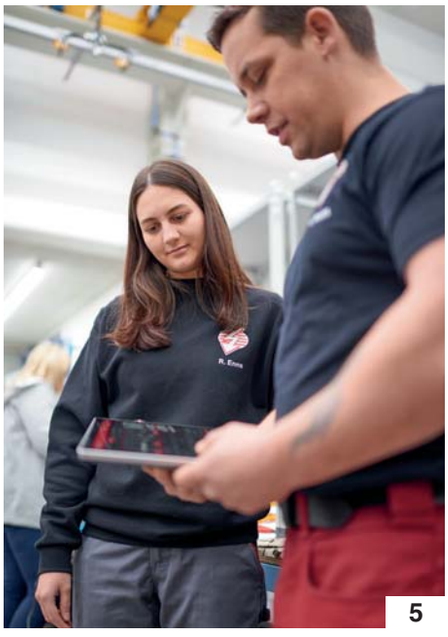
16

PER CENT
is the time saving when a trainee is completing wiring with the Eplan solution.

19

WIRING TASKS
were completed by untrained staff using Eplan software. Without Eplan Smart Wiring they didn’t manage any.

4



5

4 Every wire has its place. The digital wiring solution significantly reduces errors.

5 Eplan Smart Wiring makes shift handovers easier.

"We've restructured sequences, so the digitization project fits in well with our strategy."

Heinz-Dieter Finke
Technology Director at
H. Westermann

"We'll definitely make good progress in the next five years."

Uwe Friedrichs
Commercial Director at
H. Westermann

end point for the wiring, the system also maps out the colour, cross-section, wire end preparation and connection point designations. If a virtual prototype has been created for the system in Eplan Pro Panel, the route for the wire or cable can also be depicted. What's more, because the wiring plans are sent digitally to the workstation, changes to the project can be communicated in real time.

END-TO-END DATA RETENTION IS ESSENTIAL

Another important requirement when seeking to drive forward digitization in switchgear engineering is to ensure end-to-end data retention. "It became clear early on in the project that there were a lot of continuity breaks," says Joppen. One of the reasons for this is that, on many projects, the customers provide their own planning, and this often comes not as electrical planning in Eplan, but as a PDF wiring plan. That means data sometimes has to be captured all over again if the production process carried out by the switchgear engineers is to be digitized. "When we take care of the planning ourselves, we don't have any of that extra outlay," points out Finke. However, that only happens in about 25 percent of jobs.

As part of the implementation project, a demonstrator was developed for testing the use of paperless wiring. A switchgear system was constructed using typical components in an AE enclosure from Rittal. A scientific evaluation was conducted on the production process using this demonstrator as a basis. Various staff – a trained electrician, a trainee and an employee with basic training – wired the demonstrator as part of the study. Each of them had to complete the task once using the conventional method of printed wiring plans and once with the aid of Smart Wiring. The time spent on each individual step and the quality of the wiring was also documented. Furthermore, staff completed a questionnaire that reviewed their experience on a subjective basis.

"Preliminary results from the evaluation showed a clear time saving in wiring, even though that wasn't the primary focal point," says Joppen, commenting on the study. The employee with basic training was actually only able to wire the enclosure when using the tablet. An improvement in quality due to the standardised approach is also to be expected. Moreover, it was striking that the staff adapted the Smart Wiring solution to their method of working. For example, they used the filters on the application to better plan their work packages, which was partly how they achieved the time savings.

DIGITIZATION HAS ONLY JUST BEGUN

The implementation project shows that digitization works very well for wiring in switchgear engineering. The next step is to roll out the process on an operational level and establish it as a standard process. However, that will certainly take some time. At least, that's how Friedrichs sees it: "We'll definitely make good progress in the next five years." One of the main tasks is integrating the processes with customers to ensure complete continuity in terms of data retention. Joppen knows very well that this will not work in all cases or to the fullest extent: "There will always be a small proportion of projects that we have to complete using printed wiring plans." As Directors of H. Westermann, Friedrichs and Finke want to use digitization to harness the potential in production. ■

Digitizing business processes

Optimising. When a machinery and plant manufacturer's service technician has to fly thousands of kilometres to address even minor customer problems, there's no doubting the room for improvement. There must be a "smarter" way to do things! After all, we live in a time in which orders from China arrive within a few days even in the most remote areas of the Swiss Alps.

Text: Ulrich Kläsener

WELCOME TO THE RITTAL INNOVATION CENTER
Customers from all over the world can come here to discuss with our experts how to make their processes smarter.

What solution would lend itself well to performing maintenance 10,000 kilometres away? On machines and systems, or IT containers buried deep in a mine? What about high-tech end devices such as data goggles? If a problem arises, they transmit key data straight to the local maintenance engineer or advise the manufacturer's experts. Remote monitoring can be used to update software, arrange maintenance and, above all, perform preventive maintenance.

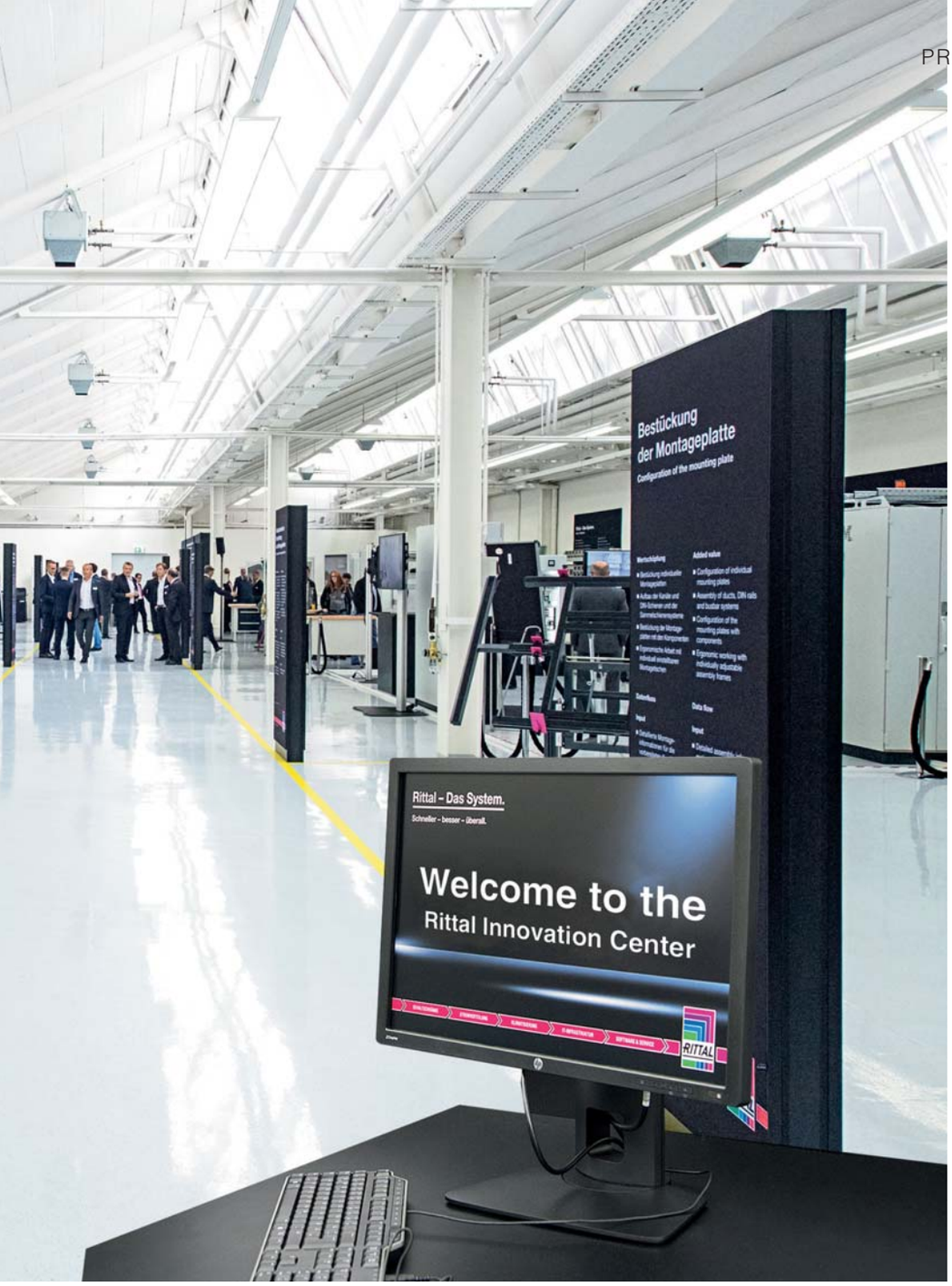
"The main advance is the direct feedback loop this creates – from the customer's maintenance engineer to the design department at the mechanical engineering company," explains Rittal CEO Dr Karl-Ulrich Köhler. "This informs the manufacturer of any specific improvements that can be made – to a certain component, for example – and can drive forward optimization, to the customer's benefit." Even data relating to malfunctioning in product applications can be put to good use by prompting modifications to the original engineering. Our efficient new world requires data that's continuous, consistent and available anytime, anywhere.

FUEL AND LUBRICATION

"Digitization is unquestionably the paradigm of our age," says Dr Köhler. Well-networked units, highly optimized departments and individual smart factories already exist." However, there doesn't seem to be widespread awareness of what is arguably the key issue – seamlessly digitized business processes. These are crucial to creating the intelligent value chains required to keep companies competitive. And it's data that powers and lubricates this driving force – in the manufacturing industry this manifests itself in the "digital twin". This virtual prototype shadows the real product, preferably for its entire lifetime – from development and construction right through to recycling, and as a reference for new designs. "Simplify your life" is the motto. After all, anything that can be digitized can also be automated and standardized.

We can see why encompassing the entire process offers so much potential by looking back to the past – when the measures used to optimize processes generally focused on individual components. Insular thinking persisted into IT.

During the 1980s and '90s, companies equipped each department with specialist software, frequently in the form of standalone solutions. This achieved certain gains in efficiency, but caused breaks between



media. Processing information across departments and tasks involved entering the very same data time and again. This caused double the work and lots of avoidable errors. “The potential for digitization is now evident in the processes used by international companies. Design, manufacturing and assembly take place at different locations, depending on the skills and tasks involved,” Dr Köhler explains. But the challenge still lies in enabling every department to access up-to-date information anytime, anywhere.

The interfaces between the specialist systems are where we need to start developing a continuous, dynamic value chain from heterogeneous, static landscapes. The digital twin is a key part of this, right from the start of a product’s lifecycle. We also need modular IT systems that grow in power to keep pace with demand High-quality product data management that drives and supports real workflows knows no interfaces. Integrated processes create a single source of truth, in other words physically identical information.

The conditions for the digital transformation of business processes are created. For one, suppliers are starting to offer smart solutions with lean software-as-a-service models and highly secure cloud offerings. Thus, companies can meet demand and fall back on standard IT scenario, which thanks to the modular principle adapts to the individual circumstances.

EXPERIENCE PAVES THE WAY FOR DIGITIZATION

“A wide spread of experience in Germany not only provides a head start in planning for digitization, but things have also been driven forward for years by relentless innovation,” says Dr Köhler. Admittedly, buzzwords such as Industrie 4.0 over-inflated people’s hopes to start with, which was followed by a wave of excessive criticism. Once the excitement died down, the first projects started to go live – such as at Haiger in central Hesse. In the 1,200 m² Rittal Innovation Center there, the company shows what can be achieved by merging digital and physical workflows in control system and switchgear engineering. Products that have been developed, designed and constructed using intelligent engineering tools go seamlessly into automated manufacturing. This is where we put the ideas behind cutting-edge methods – ranging from configure-to-order through to engineer-to-order – into practice. ■

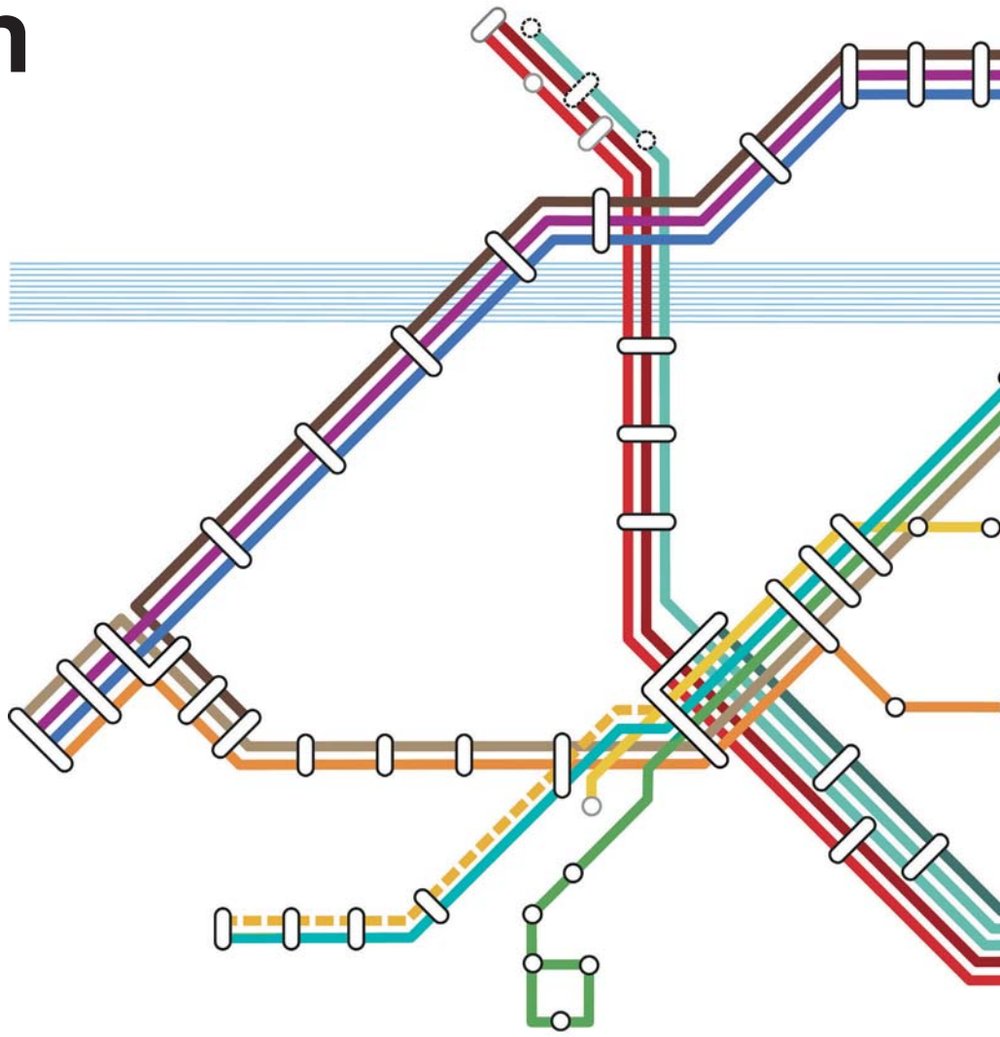
“Digitization is unquestionably the paradigm of our age.”

Dr Karl-Ulrich Köhler
CEO of **Rittal**

A great connection

Exchanging data. A small interface with a big impact. Ever since Siemens linked its TIA Portal Engineering Framework to **Eplan** Electric P8, its business locations across the globe have benefited from greater transparency, improved data consistency and significantly enhanced efficiency in the engineering process.

Text: Annika Pellmann



When controlling goods and passenger flows, a range of factors must be considered to make sure everything goes to plan. The same demand for a good infrastructure also applies to streams of data. Expanding such streams is the aim behind linking Eplan Electric P8 and the TIA Portal Engineering Framework from Siemens.

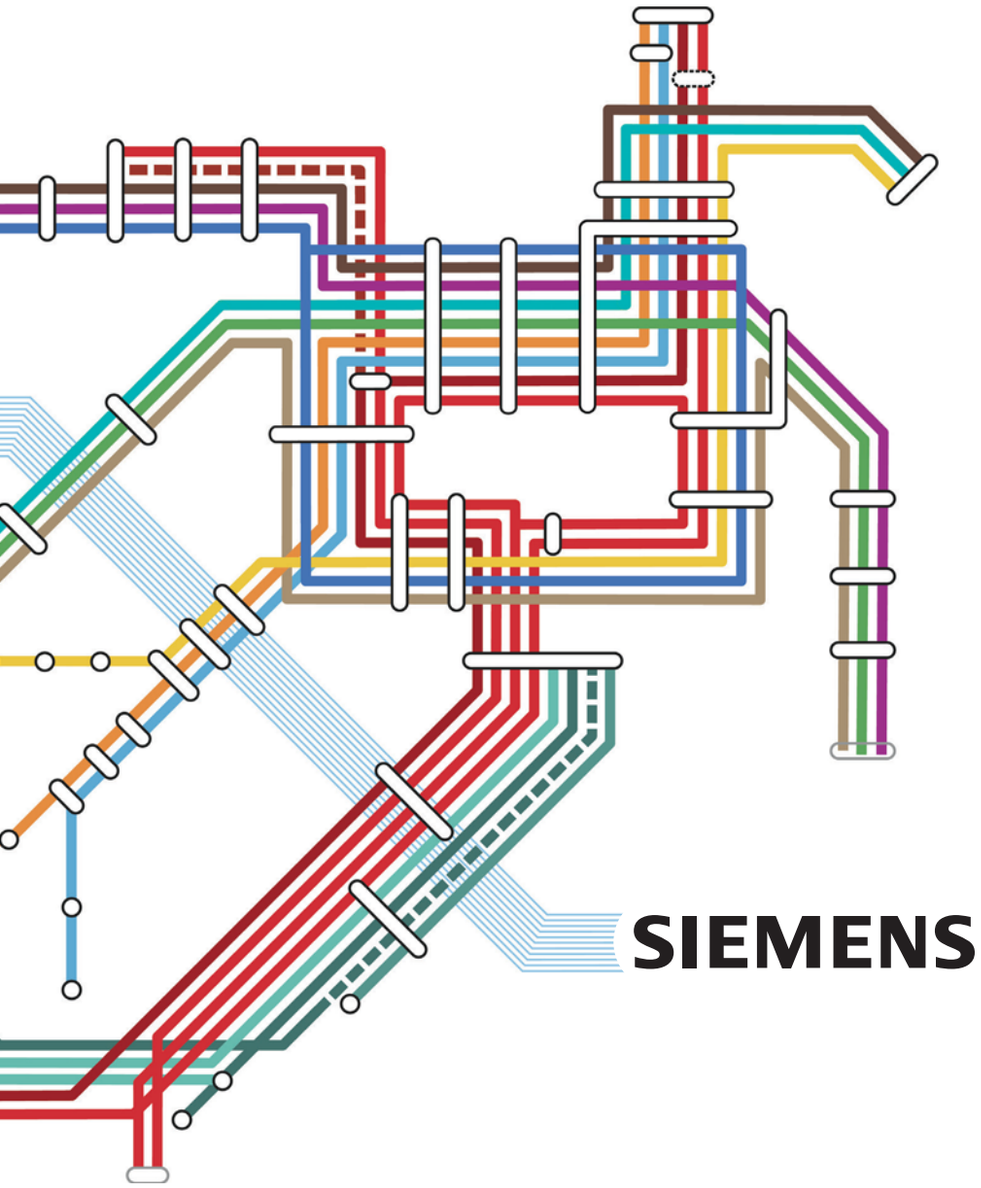
The Eplan TIA Portal Connection and TIA Portal Openness enable reciprocal data communications between the two worlds of electrical and automation engineering. Users can process and reconcile data at every stage of a given project. Eplan Electric P8 circuit diagrams, PLC overviews, hardware configurations and network installations are the kind of data intended for automatic generation via this new link. “Hardware configurations, bus data and symbolic addresses are needed in electrical and automation engineering alike. Why should you then have to enter such information twice, when you can benefit from having it all together?” explains Dieter Pesch, Head of Research and Development at Eplan, outlining the idea behind linking Eplan Electric P8 with the Siemens TIA Portal. The link enables an end-to-end exchange of detailed data when carrying out engineering tasks on automation systems.

INTENSIVE DIALOGUE

With the reciprocal TIA Portal Connection from Eplan, data is imported into or exported out of both worlds, i.e. automation and electrical engineering. The relevant data can be easily exchanged between the different

ALSO DEPLOYED AT MITSUBISHI ELECTRIC

Mitsubishi Electric also employs the Eplan interface for its MELSOFT iQ Works software package. The basis is formed by Automation Markup Language, which is deemed to be a standard for exchanging engineering data in heterogeneous tool landscapes. The dataset created in Eplan lays the foundations for the PLC hardware configuration and software programming via MELSOFT iQ Works.



workstations of electrical engineers and PLC programmers. Both are free to choose when they want to use the other's data or provide the other with their own data. This enables a controlled exchange of information, even for self-contained preparatory tasks, and is key for monitoring processes.

"At the planning and implementation stages of this joint project, we collaborated closely with Siemens on a regular basis," explains Pesch. "This allowed us to create a common basis." As such, TIA Portal Connection was based on Automation Markup Language – a modern, neutral and universal format for data exchange to IEC 62424/IEC 62714 that Pesch describes as "a technology that is evolving into one of the standards in automation."

Electrical engineers save time when they begin planning in Eplan Electric P8, as data no longer needs to be entered manually. Data initially generated in the TIA Portal is imported into Eplan Electric P8. Data transferred automatically or using the drag-and-drop function forms the basis for the produced circuit diagram. It is exactly this process that takes over manual planning tasks from the electrical engineer. Another practical advantage is that there is no possibility of misunderstandings between the different disciplines.

As a result, automation components are quicker to develop and produced in outstanding quality. Users can exchange PLC data at any stage of a project and in any direction. Later editing and reconciling the data isn't a problem, either. Performing complex, often repetitive manual reconciliations is therefore easier in the event of changes or iterations. Users benefit from transparent overviews of the configuration of the PLC assemblies, which can be processed with the help of the system. The outcome is an optimum, interdisciplinary engineering process.

A POWERFUL PARTNERSHIP

There is another advantage to linking the two worlds – in the Eplan Data Portal, Siemens provides product data that can also be accessed in the Siemens Industry Mall and via the CAx Download Manager. "Our common goal is to achieve first-class data quality and thus help engineers and PLC programmers to save time," says Dr Norbert Neubauer from the Digital Factory Division at Siemens.

The TIA Selection Tool can also be linked with Eplan Electric P8, which allows hardware configurations for PLC systems or even orders to be carried out. Configurations, for instance, can be performed in the TIA Selection Tool and then directly transferred into the circuit diagrams via Eplan Electric P8. If the user begins configuring hardware in Eplan Electric P8, the data can be validated via the TIA Selection Tool and subsequently transferred seamlessly to the TIA Portal.

Eplan and Siemens have worked together closely for many years with the aim of combining electrical engineering with PLC programming. Applications such as the TIA Portal and Eplan use exactly the same basic data. "Users therefore profit from high-quality data and planning. Even mechatronic working processes are simplified," reports Neubauer. ■

Further information
on the topic is available at:
www.eplan.com

Experiencing the evolution

Cloud park. To the west of Frankfurt, Germany, is one of the most innovative chemical and pharmaceutical sites in the world – Industriepark Höchst. The park is home to numerous companies that specialise in research, development and services. It is also where iNNOVO Cloud and **Rittal** have opened Germany's first cloud park.

Text: Kai-Uwe Wahl and Supriyo Bhattacharya

It is 8.30 a.m. in Eschborn, the headquarters of iNNOVO Cloud. The fully automated monitoring centre of the cloud supplier issues a series of red-light warnings to the network team. One member of that team is Tom Eichhorn. He sees the warnings straight away, notifies his colleagues that he is taking on the case and heads off for Industriepark Höchst.

On arriving at Industriepark Höchst, the 30-year-old goes straight to the ID checkpoint. It is shift-change time, and the start of the working day for many of the staff. The park has changed a great deal over the last 30 years, and these days fitters, office workers and scientists all rub shoulders in the entrance area. Among the most recent arrivals at the park is iNNOVO, a cloud supplier that runs container-based data centers at the site and has therefore boosted the number of IT experts passing through its gates.

The time is now 8.55 a.m. It was 25 minutes ago that Eichhorn saw the alarm telling him a network switch had failed.

iNNOVO Cloud customers have not been affected, since all the systems are backed up, but there is still a sense of urgency, as the network is the very heart of a cloud IT provider.

Eichhorn hurries as he makes his way across the site. Historical industrial red-brick buildings fly past him to the left and right, buildings where innovative pharma and biotech start-ups are neighbours with global market leaders such as Air Liquide, AkzoNobel, Bayer, Celanese, Clariant and Sanofi. Right in the middle is the iNNOVO Cloud park – Germany's first cloud data center, set up out in the open in IT containers. Eichhorn likes to recall the reactions of visitors on seeing these containers for the first time – thanks to their stable structure, the great white boxes made of steel several millimetres thick and welded together seamlessly never fail to impress customers.

DATA CENTER WITH THE HIGHEST SAFETY STANDARDS

Arriving at the solid entry door to the first container, Eichhorn speedily taps in the numerical code and opens the security door. Immediately, he is hit by warm air, the noisy din of climate-control equipment and the howl of fans. He quickly dons his ear defenders and casts a glance at the camera in the ceiling, knowing that his colleagues in the IT control centre can see him now. However, they knew someone had entered the container from the moment he opened the electronic door lock and activated the motion sensors. In no time at all, he has replaced the faulty switch and reconnected it to the redundant cluster. He looks at the read-outs for the server temperature and network throughput rates and is happy to see they confirm the systems are back in full working order. The back-up system in the data center is back to full capacity – job done!

Back out in the open in the park, he takes a deep breath of fresh air, which is very welcome after the noise and heat of the IT container.

THE SPEEDY, STRAIGHTFORWARD WAY TO IMPLEMENT CLOUD COMPUTING

Outside the containers he bumps into Stefan Sickenberger, founder and Managing Director of iNNOVO, who is explaining the benefits of the cloud park to a small group of visitors: "Through our Balanced Cloud Center solution, or BCC for short, we offer our customers a concept for creating

Stefan Sickenberger
is the founder and Managing Director of **iNNOVO Cloud**. The company created the Balanced Cloud Center concept with Rittal. Businesses can use the concept to establish a reliable IT infrastructure within a few weeks.

High-performance infrastructure

It isn't just the security team that looks after the park, a high-performance infrastructure also plays its part. The facility has a particular advantage when it comes to its Internet connection. Just a few kilometres away is the world's top-performing Internet exchange, Deutsche Commercial Internet Exchange. That makes the cloud park an outstanding data center location for companies in the region that need short latency times for Industry 4.0 applications and edge scenarios.

Flexible IT capacities

Each data center container can harness up to 300 kilowatts of power. That makes the BCC suitable for even the most demanding HPC (high-performance computing) environments – such as simulations, scientific analyses and blockchain applications.

Reliable protection

The operators of the cloud park are committed to 100% reliability. Besides a plant security team, the data center containers are also protected by a secure access system. A redundant power supply (A+B) ensures the fail-safe operation of the IT systems. Similarly, climate-control technology keeps everything running safely and smoothly.

a new IT infrastructure quickly and reliably. We work with Rittal to configure, produce and supply the system as a turnkey data center in just three months. Thanks to the modular design of the containers, users can expand the system gradually. That means their data center grows in parallel with their IT requirements. What's more, we can also run the data center for our customers, so that they benefit from risk-free cloud-based IT performance and can use the data center according to their needs."

Another selling point is performance, as the BCC is ideally suited for high performance computing (HPC): "Our system supports the expansion of individual racks with an IT output of up to 27 kW. Customers can use that performance for scientific applications and innovative solutions based on blockchain technology. But the BCC containers are also suitable for edge computing, as they form a cloud infrastructure right next to the production sites and can thus create applications for the Internet of Things," says Sickenberger, explaining the benefits to the group.

HELP WITH THE DIGITAL TRANSFORMATION

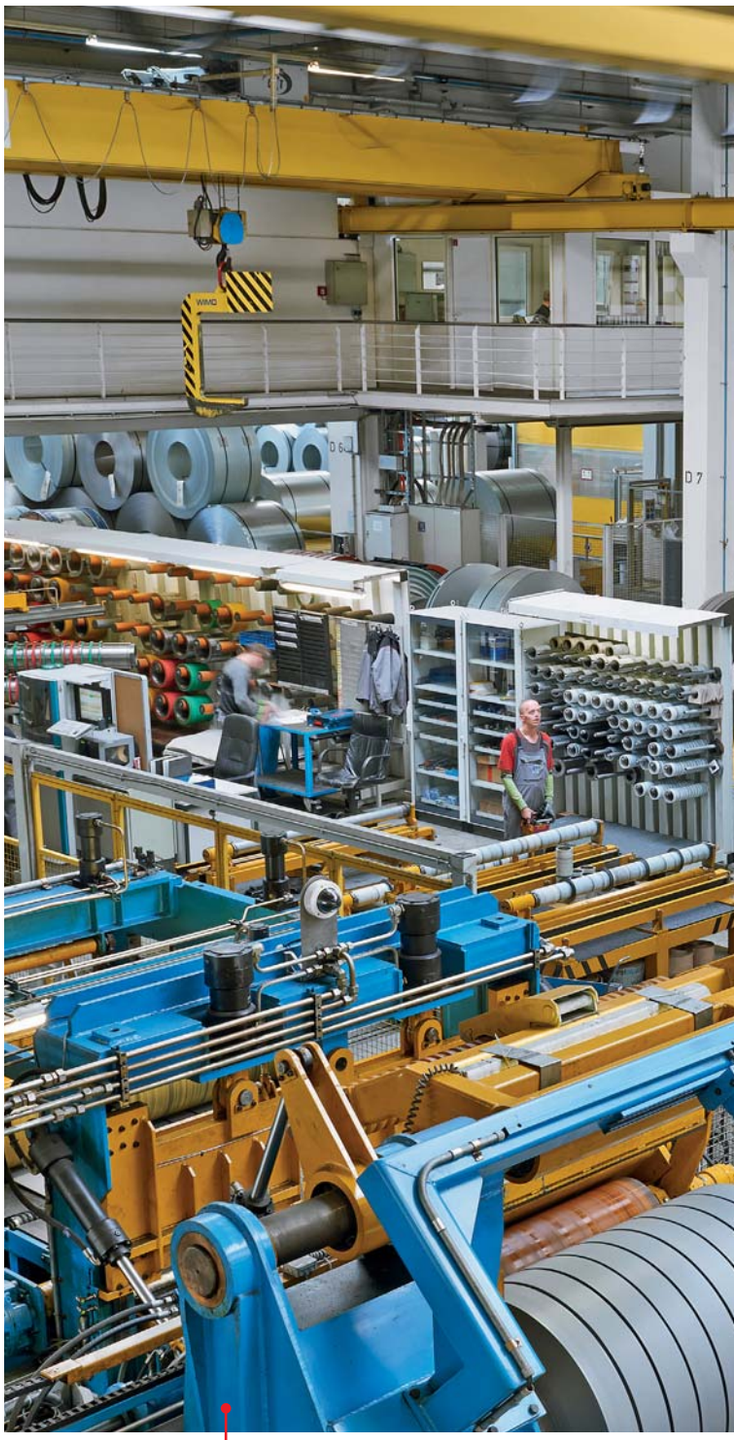
Eichhorn leaves the IT containers and heads back. Having talked to customers before, he is very familiar with the benefits of the BCC solution. A number of the pharmaceutical and chemical companies based in Industriepark Höchst have already shown a great deal of interest in the containers. After all, they too want to pursue digital transformation in their organisations. Typical requirements that demand additional IT capacities include the real-time processing of sensor data and the rapid analysis of large data volumes. To meet those requirements, companies need to have IT containers on the doorstep of the industrial plants where the data is generated. The technical term for that is edge computing.

Eichhorn takes stock on his way back to the office: "Our team has really put together a fantastic data center. Security, structure and operations all work seamlessly." He hands back his IT badge to security and leaves Industriepark Höchst. He is certain that, through the BCC containers and state-of-the-art cloud operating concept, Rittal and iNNOVO are providing valuable support for the ongoing digital revolution in the entire Rhine-Main region and beyond. ■

Making progress

Strategy. The construction project for the new Gera works shows how **Stahlo** is responding to changing market needs. Having twice the number of machines as the old site will help the state-of-the-art steel service centre boost its annual capacity to around 400,000 metric tons. A large proportion of the processes at the site will run automatically.

Text: Markus Huneke



What was once a green field is now a brown plot. On a tour of the site, Guido Spenrath points out exactly where the main production area of the steel service centre is being built. Apart from initial preparations, there is pretty much nothing to see. However, the Managing Director of Stahlo Stahlservice GmbH & Co. KG has it all mapped out in his head – the rail link that will bring in the coils, the largely automated system of cranes that will forward them on and the location of the slitting lines. The whole intralogistics system.

Stahlo, a subsidiary of the Friedhelm Loh Group and one of the most advanced and largest manufacturer-independent steel service centres in Germany, is currently gearing up to build an entirely new factory at its Gera site – right next door to its current premises. Production operations at the new site are slated to start in early 2019. “After careful analysis, it turned out that Gera is the ideal location, close to the important markets. One key factor in the

22,000

SQUARE METRES
is the total area of the new facilities Stahlo is building in Gera-Langenberg.

decision was also the workforce at the site, which we were keen to hold on to," explains Spenrath.

The investment fits in with the new strategic alignment of the steel service centre. "Stahlo has grown a great deal over recent years," points out Spenrath. The new works are set to be a growth site that will see Stahlo not only double the size of the machine park, but also increase annual production capacities to approximately 400,000 metric tons. The construction of the new site comes at a time when industrial production is undergoing far-reaching changes – particularly in the automobile industry. By building the new steel service centre, Stahlo is offering solutions for the emerging challenges. Four examples:

HIGH AND ULTRA-HIGH STRENGTH STEELS ARE ON TREND

The automobile industry is relying on lightweight construction to help it meet emissions requirements, and high and ultra-high strength steels are ideal materials. According to a recent white paper from Eurometal, the European association for steel distribution, the proportion of these steels being used in automobile manufacturing is set to more than double by 2030. What's more, the components made from these steels are getting thinner and narrower. Stahlo is already set up to meet this trend and has been processing ultra-high strength steels up to 1,400 MPa in Gera since 2004. By way of comparison, standard steels exhibit a strength of up to around 500 MPa. A second splitting line is to be set up at the new site that will be able to process steels up to 1,900 MPa. "That is unique in the whole of Europe," says Spenrath. "The new plant will also enable us to feed in wider material and produce narrower," continues the Managing Director.

Electric vehicle manufacturing also uses these lightweight materials. According to Eurometal, steel service centres should adapt their strategies to these changes and consider investing specifically in processes designed to meet this demand. Stahlo, incidentally, has already taken its first steps towards electromobility – and is leading the way as a supplier for a new electric delivery vehicle.

ALTERNATIVE MATERIALS ON THE UP

Besides lightweight steel construction, manufacturers are increasingly also looking at alternative materials. Aluminium is particularly important for automobile production – and is a growing trend. Consultants at McKinsey estimate that, by 2025, European vehicle manufacturers will be using around 770,000 metric tons of sheet aluminium products. That would be about double the volume being used today. Eurometal therefore recommends that European steel service centres consider, among other things, processing sheet aluminium products.

That's "mission accomplished" for Stahlo then. The steel service centre has been expanding its experience in processing smaller volumes for some time now. "We're still not processing large volumes, but we've got the process in hand," says Spenrath. And Stahlo is building on this experience. Both the new contour cutting plant and the slitting lines can process aluminium and stainless steels as well as high and ultra-high strength steels.

INVESTING IN TECHNOLOGY IS A MUST

Industrial production as a whole is placing ever more stringent requirements on the parts it needs. Right at the top of the list of demands for strip steel and punched parts are precision processing, maximum process automation and short-notice availability at all times. According to Eurometal, steel service centres have no other choice than to ensure their facilities always reflect the state of the art.

Stahlo is investing a total of 45 million euros in the Gera site. In addition to the new contour cutting plant and slitting lines, a significant chunk of that money is being put into technical equipment that at first seems almost unremarkable. One example of many is the new, largely autonomous crane system in the coil store. It makes intralogistics much more efficient, partly by helping the warehouse to optimise itself.

IT – THE BASIS FOR EVERYTHING

Cutting-edge IT is pretty standard these days – at least in theory. However, Eurometal has highlighted the fact that most steel service centres are currently running a sub-optimal IT landscape. Inefficient and opaque processes put the competitiveness of service centres at risk. Stahlo has done its homework. From the very start, it has been careful to keep ahead of the pack on IT, too – as part of the Friedhelm Loh Group, you could say it is a matter of honour. The steel service centre uses SAP.

"We can manufacture slitted coils up to 1,900 MPa at the new site. That is unique in the whole of Europe."

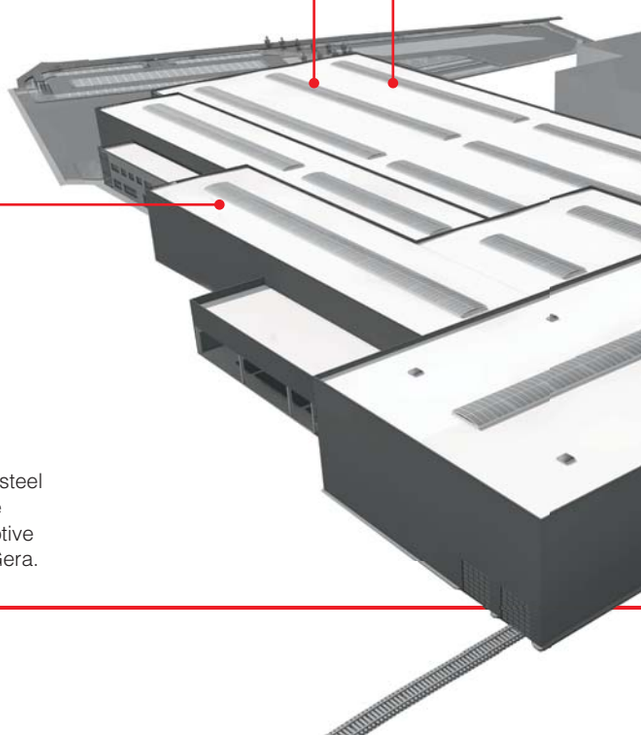
Guido Spenrath
Managing Director of **Stahlo**

Stahlo also wants the new site to go a bit further, with a big share of processes and workflows running on a largely automated basis. Operating and machine data will also be seamlessly captured in future. As a result, the company will be able to update customers on the status of their orders on request and better analyse problems in the plant – so that they can subsequently be prevented altogether.

Steel service centres must be able to meet customer requirements with increasing flexibility – and usually do so straight away. Eurometal believes a readiness to enter into solid partnerships and collaborations is a key to competitiveness. Spenrath has an example to show just how fast and flexible Stahlo can be in responding to demands: "A major car maker got in touch in the afternoon with an urgent technical problem. A plant had ground to a halt. We were able to help, and manufactured and delivered their parts in the space of a day and a half," recounts the Managing Director. This readiness to assist propelled Stahlo

2019

OPENING DATE
for the new location, which is right next to the old site. The direct rail link is particularly important to Stahlo.



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METRIC TONS
is the weight of the largest steel coils that Stahlo will be processing for the automotive industry at its new site in Gera.

from a supplier of spare parts to a firm series supplier for automobile production.

Stahlo has been consistently enhancing its reputation as a technology pioneer. For example, the company is working with a material supplier – a steel works – and makes its plants available for testing new grades of steel. It is an arrangement that benefits both sides. The investment in the new site sends out an important signal to customers, partners and the market: Stahlo is forging ahead! ■

THE MARKET CALLS...

... AND STAHLO ANSWERS!

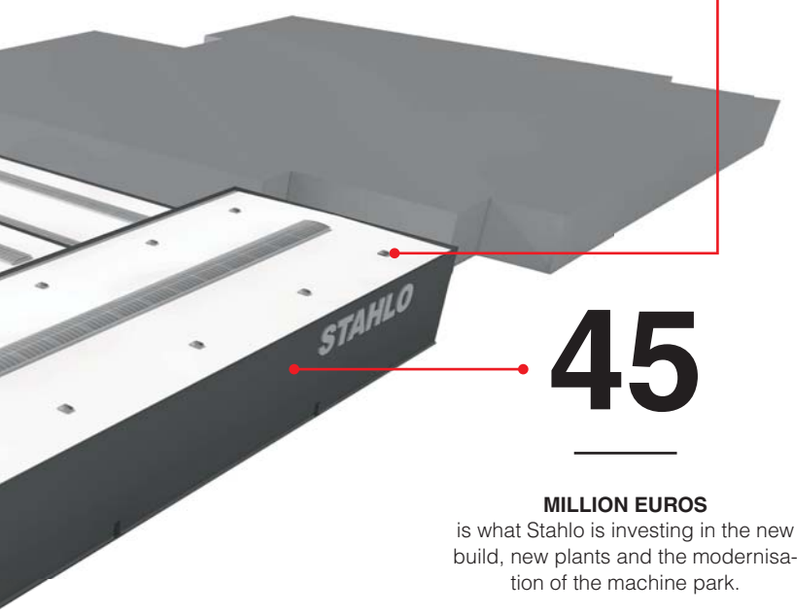
Trend toward high and ultra-high strength steels	**Investment in 1,900 MPa cut-to-length line**
Trend for aluminium	**Investing in processing capacity for aluminium**
Processes must be digitized	**Processes in the new site are going to be consistently controlled with IT**
State-of-the-art technology is a must	**New contour cutting plant and facilities**
Growing need for partnerships	**Stahlo is pursuing collaborations and technology leadership**

45

NEW EMPLOYEES
will be joining the current 75-strong team in the new production facilities.

400,000

METRIC TONS OF STEEL
will be processed on the new plants of the steel service centre from next year.



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MILLION EUROS
is what Stahlo is investing in the new build, new plants and the modernisation of the machine park.

THE NEW SITE IN FIGURES

Thanks to the new site in Gera, Stahlo is well prepared for the challenges of the future.

Partner for industry

Injection moulding. The new Managing Director Volker Hindermann is boldly opening up new markets and technology sectors for the plastics processor **LKH** and is turning the business into a specialist with customer-specific application, process and material know-how. What makes LKH stand out as an adviser to the industry? Its unconditional focus on customer requirements and sheer determination to achieve operational excellence. In an interview, Hindermann outlines his strategy.

Text: Christiane Engelhardt

Volker Hindermann
is Managing Director of **LKH**. His goal is to prepare the company for the future with a new strategy.

Mr Hindermann, LKH has more than 50 state-of-the-art injection moulding machines and around 200 employees working in production in Germany. Is this profitable?
After all, around 70 per cent of all injection-moulded parts are already being manufactured in Asia. Yes, our manufacturing is profitable, but only if we make certain changes. We need to recognise where there is room for improvement and implement such changes.

What do you mean by that?
Producing a wide range of components in the hope that something will suit the customer will not to work in the future. Any company that achieves operational excellence and has the best niche application expertise, however, is sure to impress customers in the long run.

Can you give an example?
The customer is at the heart of our business and we are constantly developing our production technology. With our machinery, which we are constantly redesigning and expanding, we are currently producing intricate small parts and robust vehicle components alike. One example of our process expertise are our air spring systems for the automotive industry made from plastic with overmoulded metal components. To this end, we redeveloped our process so that there are hardly any more unevenesses in the welded seams at the material transition points. You will struggle to find such niche expertise in precision injection moulding anywhere else and it certainly won't be as effective.

Speed is of the essence here, or to be more precise, saving time in the customer application – an important advantage over competitors in the industry...
Exactly, it's starting to be become clear just how LKH "ticks". What are the benefits to our customers? Benefits aren't just restricted to products, we're thinking ahead and asking how we can generate even more value for the customer in his day-to-day business.

How is this approach integrated into LKH product development?
We have developed a solution for a large mechanical engineering company, for instance, that re-engineers metal parts on plastic components. This new development helps the customer make impressive savings, particularly because they were able to optimise on-site manufacturing integration for easy installation. The positive feedback on our installation practices spurs us on and confirms that we are on the right path.

That sounds as if LKH is reinventing itself?
That is an apt description and exactly how I worded it myself not too long ago. You cannot fail to spot certain changes already. We now very much focus on the customer requirements when designing our systems, for instance. Customers will hardly ever hear us say "We can't do that". And we are never happy until we have created the perfect solution. Employee mentality has changed significantly in this respect, too. Customer satisfaction is undoubtedly everyone's top priority.

Are you taking a stand for quality?
Definitely! You only need to hear one example. Within a year, we have successfully halved our manufacturing waste, which is mainly down to having optimised our production processes.

What else can customers expect with regard to process optimisation at LKH?
The answer can be quickly summed up under the motto: "First the product, then the machine". Our goal today is to harmonise process engineering and moulding technology – a very important milestone in our strategic restructuring. What is also very important is that we no longer think primarily in terms of output volume, but efficient process technology. And we're bringing external knowledge, such as mould manufacturing expertise, into the business.

Is that part of your "build-and-buy" strategy?
Yes. There is a potential to build up the business that we hope to – and will – achieve by 2021. It is too early to make a statement on the buying element. Initially, we are concentrating entirely on bolstering our expertise and expanding our machinery in areas where we are already successful. We are focusing our sights on our existing resources and are putting them to better use than we were one year ago. You can only grow if you understand and control your operational business.

Why this pressure to grow? After all, as an A-grade supplier for Rittal, another company of the Friedhelm Loh Group, surely you are in a comfortable situation?
Thank you for bringing that up. A lot of people think the same way, but do you actually believe that the world's largest manufacturer of enclosure systems buys from us just because we belong to the same parent company? Surely not. Rittal procures plastic products from us because we are experts in tailoring our products to customers and their applications and deliver quality results. We have to prove this for each delivery, just as we have to do so in other markets and sectors.

This sounds like a good opportunity for a closing message.
Gladly. We are in a prime position to enter new target markets, particularly in the automotive sector. We're growing and we're getting better every day. ■

PLASTICS SPECIALIST LKH

LKH Kunststoffwerk Heiligenroth GmbH & Co. KG develops and manufactures an application-focused portfolio of plastic products at its cutting-edge facility in Rhineland-Palatinate for customers in the electrical, automotive and mechanical engineering sectors. The company's most important technologies include thermoplastic precision injection moulding, hybrid injection moulding (metal/plastics), multiple component injection moulding and assembly installation, including laser marking and ultrasonic welding.

Plug and play

VX25 Blue e+ integration solution. According to the "Enclosure engineering 4.0" study, around 72 per cent of the time required to install an enclosure is spent on mechanical configuration and wiring. **Rittal** can accelerate this process thanks to an integrated cooling and enclosure solution – fully in line with the plug-and-play principle.

Text: Saskia Kaufhold and Hans-Robert Koch

Preinstallation

The keyword is preinstallation. Previously, enclosures and climate control units could only be delivered separately. Now, Rittal offers an integrated turnkey system that uses the plug-and-play principle. Besides making ordering easier, this also helps save precious time. Rittal delivers the system – including the door switches and cabling – fully configured, enabling the user to start configuring the interior straight away. As a result, the enclosure's high standard of protection is maintained, which, until now, was never an easy task when installing the climate control unit on the enclosure.

Sound planning

The Eplan Data Portal creates the perfect basis for recording everything in minute detail as early as the planning stage. The online platform provides the user with a digital twin of the new solution. With the help of the Eplan Pro Panel, the virtual configuration can be mapped out in precise detail – even at the early design stage. Moreover, the Thermal Design Integration function uses different colours to display hotspots, exclusion zones dictated by ventilation requirements and an optimum climate-controlled area within the enclosure. The user receives all necessary data on the chosen articles via the Eplan Data Portal as usual. Orders can be placed quickly and easily in just a few clicks using the Rittal online shop.

Climate control

The Blue e+ cooling unit integrated into the end-to-end solution is the most efficient on the market. Blue e+ works with a hybrid comprising a compressor and passive cooling, allowing average energy savings of 75 per cent over conventional solutions. The climate control unit always generates the exact output needed for the ambient temperature. Given that users no longer need to fit the cooling unit themselves, the plug-and-play principle means risks such as faulty cut-outs are a thing of the past. Thanks to the position in the enclosure being predefined ex works, users can completely focus on the electrical engineering aspect of installation.

Intelligence

Always being one step ahead will be possible in the future thanks to predictive maintenance. With the plug-and-play solution, users have laid the foundations for such Industry 4.0 applications. In future, device information from the Blue e+ cooling unit can be easily stored and evaluated via the cloud. The outcome will be optimised maintenance, lower operating costs and significantly shorter down times. This is all possible thanks to the optional IoT interface of the intelligent climate control unit that can be easily integrated into a wide range of communication structures.

COMMITMENT

UNIQUE HONOUR
Presenting the certificate to Professor Loh, Minister Rhein emphasised that an honorary professorship is a unique – and rarely awarded – honour in recognition of outstanding services to the state of Hesse.

Well-deserved honour

"You are a very special Hessian," said Boris Rhein, Minister for Science and the Arts of Hesse, as he awarded Dr Friedhelm Loh his honorary professorship late last year. The main speaker, Professor Hans-Jörg Bullinger, former President of the Fraunhofer-Gesellschaft and member of the Advisory Board of the Friedhelm Loh Stiftung, singled out the entrepreneur's innovative spirit, above all, saying: "You make things that are new. Simply managing things that already exist is not enough for you." Dr Loh was honoured for more than his business efforts, however. His active commitment to the region's social, education and cultural spheres also earned him this accolade. "We have a responsibility towards disadvantaged people," Professor Loh says, which helps to explain his decision to raise the capital of the Rittal Foundation, which he set up in 2011 as a thank you to the region, from five to 20 million euros.

CELEBRATING PROFESSOR LOH
The Hesse Youth Symphony Orchestra provided a musical interlude between the speeches by Professor Stephan Holthaus (very top) and Professor Bullinger.

200,000

Help that hits the spot.

Together, the workforce of the Friedhelm Loh Group and CEO Professor Friedhelm Loh raised 200,000 euros for the 2017 annual donation to social facilities. The recipients included “Diakonisches Werk an der Dill”, which offers assistance to disabled and sick people, and the charity Jumpers e.V., which provides a wide-ranging recreational programme for disadvantaged children and teenagers in Gera. However, the Friedhelm Loh Group also supports projects further afield – this year a children’s home in Hajjah, Yemen, which the donation is helping to keep open. “Experiencing how grateful the people are here and offering hope in the face of such adversity fills our helpers with those very same emotions,” says Matthias Leibbrand, whose NGO Vision Hope International e.V. can offer a home to 80 children thanks to the donation. In total, thirteen social facilities benefited from the annual donation – many of them from the region surrounding the Friedhelm Loh Group’s headquarters in Haiger.

Rittal Foundation

Climbing frame for tiny tots

Rough and tumble, clambering around and doing what children do best – the tots at the Kükennest daycare centre in Greifenstein Allendorf can finally give it their all once again. This has been made possible with the aid of funding from the Rittal Foundation, amongst others. The centre used the money to tear down the 30-year-old climbing frame and build a brand new replacement. Lars Schleifer, the daycare centre’s director, thanked the foundation for its generous support.

Cideon named top employer

top EMPLOYER DEUTSCHLAND 2018
CERTIFIED EXCELLENCE IN EMPLOYEE CONDITIONS

The Top Employers Institute has named Cideon a “Top Employer Germany 2018” for the first time. The other companies in the Friedhelm Loh Group have also received this award in the past. “For the last four years, Eplan has scored high marks in the categories onboarding, performance management and career and succession planning. We want to continue this roll with Cideon,” explains Inga Kleine-Boymann, Team Leader HR at Eplan and Cideon. The “Top Employer Germany” awards are presented every year to highlight companies with outstanding HR strategies, employee focus, attractive working conditions and opportunities for further development.

“You can do it!”

The idea behind the new “Kleidertreff” study aid project in Dillenburg is to help migrant children and teenagers get to know their own capabilities and bring them to the fore. With the aid of the Rittal Foundation and Volksbank, the project offers them help with their homework and study support three afternoons a week. This service is currently performed by four women who worked as teachers in their home countries before also migrating to Germany.

Early learning pays off

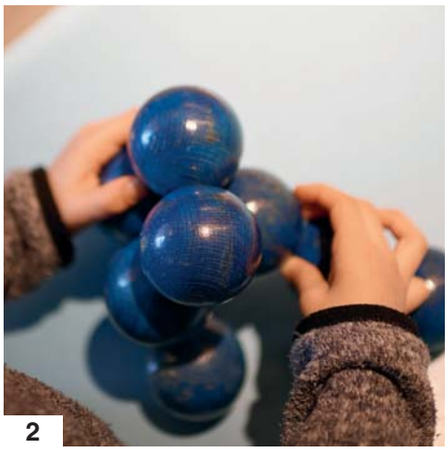
Promoting education. In the "Little Scientists' House", young children from nursery schools and their teachers explore the world by conducting exciting experiments. The aim is to arouse their interest and thus lay the foundation for perpetual, lifelong learning. The **Rittal Foundation** has been supporting the project for years.

Text: Rebecca Lorenz

MINI RESEARCHERS
Whether it's sodium bicarbonate, water or soap, Leonie (left) and the other children at the Protestant nursery in Herborn love conducting experiments.

Next comes the sodium bicarbonate, says Leonie, focusing hard on the mixing bowl in front of her. She steadily measures out two tablespoons of the powder before adding it. A little more red food colouring, a squirt of soap, and then the little girl places the mixture inside a small model volcano made of papier-mâché and grasps a pipette. "Let's see if the experiment works." And indeed – after just a few drops of vinegar, the artificial volcano starts to erupt. The six-year-old points incredulously at the frothing, red liquid. "Look – it works!" Once the show is over, she turns excitedly to the teacher. "Can I do it again?"

Experiments like these are part of everyday life at the Protestant nursery in Herborn-Schönbach. Children are naturally curious. They will spend hours



examining things in their surroundings. You just have to give them the chance," explains Christine Michels, the nursery's director. Children hit upon even complex phenomena such as chemical reactions, physical states and gravity all by themselves – simply by watching, touching and trying things out. "Whether it's a volcano erupting, snow melting or a scarf falling onto the floor, children ask all sorts of questions – they want to understand how the world works."

SHARED JOURNEY OF DISCOVERY

Instead of simply providing the answers, the teachers in Schönbach encourage the children to find things out for themselves. "Of course, each child has a different knowledge base, depending on its particular interests," Michels says. But this doesn't hamper their experiments. "The children think things through together, talk with one another and keep on searching for a solution until the experiment works." This not only helps them to understand basic principles in science, technology, engineering and mathematics (STEM), but also helps to develop the "soft" skills they will need throughout their lives – such as teamwork, creativity and the ability to communicate and solve problems.

The task of the nine teachers at the Schönbach nursery is to offer the children the best possible support in their endeavours. To help achieve this, for the past six years Michels and her co-workers have been going along to the "Little Scientists' House". This charitable foundation works throughout Germany to promote early learning in the STEM subjects. The Federal Ministry of Education and many local network partners support the project. One such partner is the Mathematikum science museum in Giessen.

"We equip the teachers with the necessary tools in practical training sessions," explains Lisa Peter, a coordinator for the "Little Scientists' House" at Mathematikum Giessen. After all, STEM subjects are still frequently overlooked in the training courses to become nursery teachers, particularly in Germany. "We want to show the participants that there's nothing to be scared about. Even topics such as water, optics and light can be fun and are easy to teach – as long you relate them to children's everyday lives." Conducting experiments and trying things out therefore play a key role alongside theory and methodology.

"Of course, we provide the teachers with ideas and inspiration – but the idea is for them to also think up and try out their own experiments," explains Melanie Schmidt, another coordinator at Mathema-

1 What happens when I mix colours? The children find out the answer while they play at nursery.

2 Basic technical knowledge is required to build a stable pyramid out of spheres.

3 If one child experiments, all the others join in. Their strengths and weaknesses complement each other perfectly as a result.

tikum Giessen. “By the time they have completed this additional training, they should feel they can help the children to explore and research whatever grabs their attention.” Peter and Schmidt place great store on group reflection to achieve this high level of confidence. How can experiments be incorporated into everyday nursery life? What age groups are they suitable for? How can experiments be adapted to cater for younger children? The course raises and answers these kinds of questions, amongst others.

The effect this additional guidance has on teachers’ everyday work is exemplified by Simone Rehr’s experience. She is one of two teachers from the nursery in Schönbach to regularly attend training sessions. “Of course, there are subjects that I feel unsure about. This regular training gives me the confidence I need.” Not only that, but the rest of the team also benefits from the new ideas, as Rehr is more than happy to share them with her co-workers.

PROVEN EFFECT

It’s not just the teachers, but also the children that the “Little Scientists’ House” has a lasting effect on. “We can see the rewards that the project is reaping in the open-mindedness of the children and the way they ask questions about everything,” Rehr reports. Instead of relying on the adults’ knowledge, they develop their own problem-solving strategies. This shows the children that they can achieve things with their own knowledge, which boosts their self-confidence. “As the profound effect of the ‘Little Scientists’ House’ has been scientifically proven in numerous studies and regular quality control, six years ago we decided that the Rittal Foundation would donate regularly to the project,” says Friedemann Hensgen, Chair of the Rittal Foundation. The foundation has handed over almost 50,000 euros so far to enable 34 teachers from 17 nurseries in central Hesse to regularly attend the training run by the “Little Scientists’ House”. The results speak for themselves, as 13 of the sponsored nurseries have now been certified by the “Little Scientists’ House”, four of them already for the third time. In real terms, this means that they have shown how they’ve integrated research into everyday nursery life, thus paving the way for the children’s educational success.

“This is another reason why the commitment shown by the ‘Little Scientists’ House’ is so important to us – because promoting education is one of the foundation’s key missions,” Hensgen explains. The fact is underlined by the foundation’s support for projects such as Hippy (promoting migrant children’s language development), the Amadeus Junior Academy (early-years musical development) and social work in schools. “Anyone who strongly believes in equal opportunities for all should lose no time in encouraging children as early as possible. This already starts building a solid foundation for equal educational opportunities at nursery level.”

LIFELONG LEARNING

The Rittal Foundation is not alone in promoting sound education, as the Friedhelm Loh Group behind it has been doing the same for many years. “The Friedhelm Loh Group aims to ensure that fully rounded education is achieved in the regions where it operates,” Hensgen explains. After all, the increasing pace at which digitization and globalisation are transforming the working environment is reinforcing the need for lifelong learning. Based on the motto “Knowledge – Ability – Action”, the group invests a lot of effort in training school leavers and graduates, and also in continuously developing its staff through the Loh Academy.

“But even a top-notch training programme won’t help if those taking part aren’t interested and curious enough to engage,” Hensgen points out. Because the seeds for this mindset are sown in early childhood, he considers the ‘Little Scientists’ House’ a game-changer. This is why the Rittal Foundation will be upping its commitment to the project once again this year. “The ‘Little Scientists’ House’ has just added a new component – IT. This enables us to equip the children even better for the digital future.” The teachers at Schönbach are also very interested in this development. “I can’t wait to see what the seminar’s like,” says Rehr. “Because I’ve never tried my hand at any programming before.” ■

Three questions

Professor Albrecht Beutelspacher
Director of **Mathematikum Giessen**

Why is it important to promote early learning in the STEM subjects?
Children are naturally curious and hanker for knowledge. Early learning in the STEM subjects relates directly to the world that they live in – unlike at school. They find experiments exciting thanks to the fluid boundary between curiosity, exploring the environment and research.

Why do teachers find it so difficult to promote this?
These subjects are not focused on in their training. This means that the teachers need showing that they encounter these topics on a daily basis – whether it’s climbing stairs, shopping or cooking. Once they realise this, enthusiasm takes over from fear and trepidation.

What’s so special about the “Little Scientists’ House”?
They promoted STEM subjects from the start. The high level of continuity and quality makes the “Little Scientists’ House” stand out. Even the trainers themselves receive training – not just the teachers. This has kept on upping the quality throughout the last decade.

EXPERIENCE

Focus on automation

What does it take to speed up processes in control and switchgear engineering, boost profit margins and reduce both personnel costs and delivery times? Control and switchgear manufacturers will be offered specific, practical answers to these and other questions at the second Rittal Automation Day in May 2018. The event will be focussing on Control and Switchgear Engineering 4.0. The first event in Haiger on 26 October 2017 already attracted some 50 entrepreneurs, planners and managers to discuss the everyday challenges they face with the aim of devising future-proof solutions. The experts at Rittal shared their expertise on all the key issues throughout the entire process chain in presentations, case studies and live demonstrations. Besides gemming up on theory, participants also got to experience Control and Switchgear Engineering 4.0 in action in the Rittal Innovation Center.

Fancy a look for yourself?
We invite you to take a guided tour of the Rittal Innovation Center:
innovationcenter@rittal.de

Virtual insights into steel plant

The world's leading company in the fireproofing sector, RHI Magnesita, recently opened the virtual door to its products. It is now using virtual reality to offer existing and potential customers a tour of a converter, for example, to give them the chance to try out how products work and to learn about the individual stages involved in production. This cutting-edge VR presentation app was custom-designed for the company by Cideon. Helmut Haider, Project Manager Refractory Design at RHI Magnesita, says: "This application provides our customers with a deep and realistic insight into how our products work. This is extremely important in helping us to maintain our competitive edge."

An excellent partnership

The Maag Group recently presented its "Supplier Special Award" to Kiesling Maschinentechnik as one if its top three suppliers. Maag has been a leading manufacturer of equipment for the plastics industry for decades. "We're ready to continue pulling out all the stops for the Maag Group and play a key role in supporting Dover Corp.'s growth strategy!" said Director Rolf von Kiesling in response. The subsidiary of the U.S. Dover Corporation conglomerate cited "top quality, outstanding dedication and high speed" as the key factors that secured Kiesling Maschinentechnik the award. The company has been supplying Maag with CNC-machined turned and milled parts and welded constructions for many years.

IT competence center in India

Rittal has opened a new IT competence centre in Bangalore to provide support for its Southeast Asian subsidiaries and their customers implementing complex IT projects. "This now optimises the sales, engineering and service we offer our customers for their data center projects," explains Angelo Barboza, who is in charge of the Rittal IT team. He reports that orders are being processed far more efficiently as a result. It is already two years since Rittal set up its first IT competence centre in Lithuania. Customers benefit from the all-round advice and high-quality solutions offered by this single point of call. Martin Kipping, Director International Datacenters at Rittal, reveals that the next IT competence centres are already in the pipeline. "We are planning to tackle China and the USA this year, more than likely followed by the Middle East and Africa during 2019."

Discussions with suppliers

Plastics specialist LKH met with ten of its key suppliers and purchasing staff from Rittal in November 2017. Participants at the "Tool Suppliers' Day" discussed how to improve the process of creating products. "The aim is to promote even clearer communications to make sure we achieve the aims of our joint projects," explains Thomas Ritter, Head of Process Management at LKH. Optimising communication helps the suppliers to understand even better what LKH requires. Standards for digital communication were also discussed. "We are sure that the event has helped us work as a team of equals with our technology partners," Markus Kretzer, Commodity Manager S&P CENF at Rittal, sums up.

Leading light

Cave lighting. Whether it's because of fossils, paintings or rock formations, caves are quite simply fascinating. Cave Lighting is now shedding light on exceptional features in caves across the globe. Enclosures from **Rittal** are utilised for the company's numerous projects to protect sensitive components from extreme environmental conditions.

Text: Susanne Theisen

5.8 km

A NETWORK OF PATHWAYS meanders through the Kluterthöhle cave. Guests come to see the nature and for health reasons, too. After all, the cave's particular climate is renowned for its therapeutic qualities.

370

MILLION
years old. The Kluterthöhle cave was formed by a gigantic Devonian coral reef that dried up due to the upwards shift of the low mountain range.

100

PROJECTS –
from the German town of Bad Segeberg to the Cayman Islands – have been carried out by Cave Lighting.

It was a "wonderful gypsum cave in West Ukraine" that kindled Alexander Chrapko's interest in speleology, the study of caves. "I was 13 years old and had just joined a speleologist group in the youth centre in Kiev. We carried out expeditions, venturing into both tourist caves with set paths and wild, unexplored caves. I was utterly fascinated by what I experienced back then," the entrepreneur (53) recalls today. Following his teenage adventures, Chrapko went on to study geology. The collapse of the Soviet Union, however, meant he was forced to leave university. He and his family then moved to Germany, where he took on shift work, completed an apprenticeship in IT and – after many years in the electronics sector – founded his first very own business, Germtec, which provides solutions in the areas of LED lighting, energy and medical technology, control and automation. It was not until 2005 that Chrapko turned his lifetime hobby into his profession with Cave Lighting. Since then, he has been transforming tourist caves across the globe with lighting and musical concepts.

TRICKY – AND EXTREME

Despite his vast wealth of experience in speleology and electrical engineering, lighting up tourist caves is never a routine task for Chrapko. The first step is to carry out a full inventory, check the condition of the cave, discover its special features and enquire about the operator's aims. Nature conservation and animal welfare or sometimes even archaeological factors that have to be agreed with Germany's heritage preservation authorities may also need to be taken into consideration.

Once that's all done and dusted, the lighting experts set about drafting the technical details, which is always a tricky task. The business follows its golden rule – the technology should be invisible, i.e. as small and well hidden as possible. "Visitors should ultimately see an object of nature, not our installations," says Chrapko, who believes the greatest challenge is actually dealing with the extreme conditions in the caves. Such conditions place high demands on technology. "Humidity levels in the caves are usually over 90 percent. Now and then, there are seasonal floods and extremely low temperatures. Fluctuations in electricity, falling rocks and vandalism are yet more potential problems. Or creatures such as rats, martens, dormice and insects that like to chew on the wiring – if they can get to it."

To stop the cave inhabitants nibbling away at the technology and otherwise ensure it can function throughout the long opening hours, Cave Lighting only uses robust and high-quality materials. Chrapko: “This is the only way to make sure everything is completely sealed, doesn’t corrode and works reliably.” That’s why he prefers to use Rittal products for protecting the components.

After all, when purchasing from the enclosure technology system supplier, Chrapko knows from experience that the stainless steel enclosures are immune to high humidity, safeguard the sensitive electronics against lightning strikes and effectively fend off critters. Uneven ground is no match for the technology either, as the metal keeps the enclosures sealed and in shape.


1

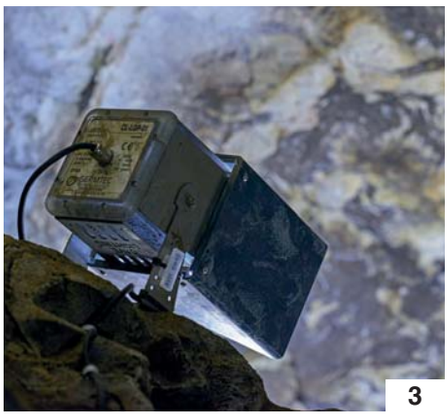
A CONCEALED UNDERGROUND SEA OF LIGHTS

It is therefore no wonder that enclosures from Rittal were also chosen for the new lighting system in the Kluterthöhle cave in Ennepetal. “The old lighting concept in the cave was highly disappointing,” Chrapko explains. The focus was mainly placed on lighting up the network of paths, leaving most of the surrounding areas in the dark. “When we were redesigning the concept, local speleologists suggested that the cave should be initially cleaned and its layer of clay removed,” he reports. “After cleaning up the first part, we realised that there was a lot more to discover than first expected.”

The reason for this was that fossils in the stone revealed the Kluterthöhle cave was part of a gigantic coral reef during the Devonian geological period. The cave is littered with well preserved fossils such as sponges, mussels and corals that lived on the reef around 360 million years ago. “To travel back in time like that is something you don’t get to do often. In fact, you can’t experience it anywhere else in Germany” says Chrapko enthusiastically. The discovery gave him and his team yet more motivation to bring an exceptional lighting concept to life.

They therefore decided to design and use their own system, which, besides a comprehensive range of lighting, features the required control units, SD memory cards, radio receivers with antennas and an integrated MP3 player. This enables entire music and light performances to be created, stored and controlled in the cave.


2


3

FOREVER FLEXIBLE

The control technology is kept safe in an AE series stainless steel enclosure from Rittal. Combining top quality with maximum efficiency, the enclosure corresponds exactly to Cave Lighting’s philosophy, as no matter whether the compact housing is placed horizontally or vertically, the mounting plate is always quick and easy to attach. Depending on the chosen cable bushing, flange plates can be quickly replaced and wall brackets can be attached to the outside of the housing, even at a later date. It is also possible to bay several enclosures. If more space is required, Cave Lighting also uses TS 8 bayed enclosure system variants.

When it comes to power supply, overvoltage protection, terminal blocks, connectors and control technology, Cave Lighting once again only uses high-quality products. Their business partner of choice is Phoenix Contact. Teaming up with the company was an obvious decision for Chrapko, and not just because of the need for quality. “We all operate on an international scale, meaning global distribution doesn’t pose a problem. Additionally, planning the enclosures from Rittal using the Eplan Engineering tools with the corresponding components from Phoenix Contact is easy thanks to the long collaboration between the two companies.”

STRONG PARTNERS – EVEN IN THE FUTURE

For their current project, Cave Lighting decided once again to use enclosures from Rittal. “At the moment, we are working in the

1 To ensure everything works smoothly, Cave Lighting uses high-quality products from Phoenix Contact for the power supply, overvoltage protection, terminal blocks, connectors and control technology.

2 The components are kept safe in stainless steel enclosures from Rittal. The advantage to this is that the enclosures are not affected by the high levels of humidity, can safeguard sensitive electronics even against lightning and are kept out of reach of hungry cave inhabitants. Uneven ground is no match for the technology either, as the metal keeps the enclosures sealed and in shape.

3 Tucked away in discreet areas, the economic LED lighting offers all the benefits of modern multimedia technology – whilst also adhering to the requirements of the IP68 protection standard.

Dachstein Giant Ice Cave in Austria. The greatest challenge here will to be reduce the lighting's energy consumption in order to protect the layers of ice. The aim is to drive down the consumption from 30 kWh to 2.5 kWh and house the installations as far away from the ice as possible," says Chrapko, summing up the task ahead.

The entrepreneur doesn't doubt for a second that he will find a solution. As a speleologist, he is delighted by the prospect of bringing yet another cave to light. Positive feedback on social media, amongst other things, is testament to Cave Lighting's fantastic work. "When we're finished setting up the lighting in a cave, you suddenly notice a lot more pictures of it on Facebook or Instagram. That's high praise for us," says Chrapko. He adds: "I am always pleased that our technology helps open visitors' eyes to the beauty that lies underground." ■

"I am always pleased that our technology helps open visitors' eyes to the beauty that lies underground."

Alexander Chrapko
Managing Director of **Cave Lighting**

CAVE HIGHLIGHTS

Throughout his lifetime, Alexander Chrapko has researched almost 300 caves across the globe. These are his top three must-see locations:

HERBSTLABYRINTH, BREITSCHEID, GERMANY
The Herbstlabyrinth cave has fascinating stalactite and stalagmite formations, various large chambers and long networks of tunnels. The "drip hall" features lots of different formations.
www.schauhöhle-breitscheid.de

NATURAL BRIDGE CAVERNS, SAN ANTONIO / TEXAS, USA
A 20-metre-long piece of limestone in the form of a bridge forms the entrance to the cave. Visitors can go 63 metres underground at a constant temperature of 21 degrees Celsius.
www.naturalbridgecaverns.com

GROTTEN VON HAN, ROCHEFORT, BELGIUM
Three of the ten kilometres of the stalactite and stalagmite formations are open to visitors. Highlights include the 5.8-metre-high and 12,000-year-old stalagmite "The Minaret" and the seven-metre-high stalagmite "The Trophy".
www.grotte-de-han.be/en

A LOGISTICAL TOUR DE FORCE
Due to the lack of vehicle access to the Coburger Hütte in Tyrol, the components for the energy storage solution had to be flown in by helicopter.

Live-wired lodge

Energy storage. Whether on top of a mountain, at sea or in the desert, Tesvolt ensures a constant supply of electricity by using standardised components from **Rittal** for its industrial, large-scale battery storage systems. The result are short delivery times, greater flexibility and improved stability.

Text: Sophie Bruns

A popular destination for hikers
It is in part thanks to the energy storage solution from Tesvolt that guests at the Coburger Hütte can enjoy a whole host of amenities, such as Internet and hot water.

SUCCESS!
By the end of the day, both the new solar panels and the corresponding battery storage system were installed. The latter ensures a supply of electricity, even in cloudy conditions.

The mountain top majestically towers above the crystal clear Seebensee lake. After catching their breath, hikers continue their struggle along the "high route". Its countless winding paths have earned the route a reputation as one of the most challenging hikes in Tirol's Mieming mountain range. But after climbing for more than three hours, the hike is almost over – the Coburger Hütte is already in view. Once at the lodge, hikers quickly forget their ordeals and sit down to enjoy some traditional Austrian delicacies. Almost 1,900 metres above sea level, the German Alpine Club lodge has a lot more to offer than just a breath-taking panorama. Its hot shower facilities, drying room and even its Internet connection have turned the Coburger Hütte into a popular port of call for mountain climbers in recent years. But such facilities wouldn't be possible without a reliable electricity supply.

That is why the German Alpine Club relies on energy storage solutions from battery storage systems manufacturer Tesvolt. It was only last year when the start-up equipped the lodge – by helicopter – with cutting-edge technology. Besides a lithium-ion battery with a capacity of 77 kWh, new 16 kWp solar panels ensure an environmentally friendly and reliable power supply. Even bad weather doesn't faze the operators any more. "Thanks to the new battery storage system, the lodge can continue consuming electricity from the solar panels, even if it isn't sunny," reports Daniel Hannemann, CEO and founder of Tesvolt.

This is all down to the extremely powerful battery cells. "Our storage systems are very rugged. They have proven to be highly reliable in industrial applications as well as in difficult, remote areas," explains Hannemann. Connected to wind, solar, hydroelectric, biogas or CHP power stations, the energy storage solutions from Tesvolt offer maximum flexibility.

RELIABLE SYSTEMS MADE IN GERMANY

It therefore comes as no surprise that Tesvolt is experiencing exponential growth on the up-and-coming battery storage market. After all, besides international industrial companies, construction businesses and service providers are increasingly employing energy storage systems to reduce their power connection costs and enhance the reliability of their electricity supply. In countries where network failures occur on a daily basis, energy storage systems are even a fundamental requirement to keep up with the competition.

"Reliable energy storage systems call for several components to work together in harmony," explains Hannemann. Besides the battery cells, this includes energy distribution, climate control and plant monitoring. These need to work seamlessly because they are ultimately decisive for functionality. This is also why Tesvolt only uses top-quality components.

Three questions

Daniel Hannemann

CEO and founder of
Tesvolt

What are the biggest challenges you face as a start-up on a relatively new market?
The market has yet to establish standards. For that reason, manufacturers' strategies differ greatly. Tesvolt sees itself as a battery manufacturer. Apart from the known brands such as Samsung and LG, there are not many companies that operate in this field. The greatest challenge we face is therefore undoubtedly price pressure.

How are Rittal solutions helping you to overcome these challenges?
Thanks to the standardised solutions from Rittal, we have been able to shorten our delivery times. This has allowed us to speed up product delivery and offer good value for money. Moreover, we attach a great deal of importance to the quality of "made in Germany" manufacturing. Rittal was able to cover all of these bases.

What has changed since you started using these solutions?
Our customers now benefit from standardised, turnkey solutions, which function seamlessly even under extreme conditions. This means even projects such as the Coburger Hütte can be completed quickly.

"For a short while now we have been using system components from Rittal," reports Hannemann. After all, the wide range of standardised products enables short delivery times and technical flexibility. "Shortly after founding the company, we were still focusing on custom-made products," reveals Hannemann. But these used up too much time and were also highly prone to error. "The solutions based on standard products from Rittal ensure that we no longer have this problem. They can be delivered quickly, adhere to all relevant standards and exceed our quality expectations." At the bottom of it all, there is nothing worse than products that rust after just a few years.

THE RIGHT SOLUTION FOR EVERY APPLICATION

In order to find the right energy storage solution for each application, Hannemann and his colleagues seek regular advice from Rittal experts, such as Andreas Kühne, Product Manager for Energy Storage Systems at Rittal. "We help Tesvolt to plan and configure energy storage solutions so that they correspond exactly to the customer requirements," says Kühne. Alongside enclosures, Tesvolt therefore also uses components for power distribution, climate control and monitoring.

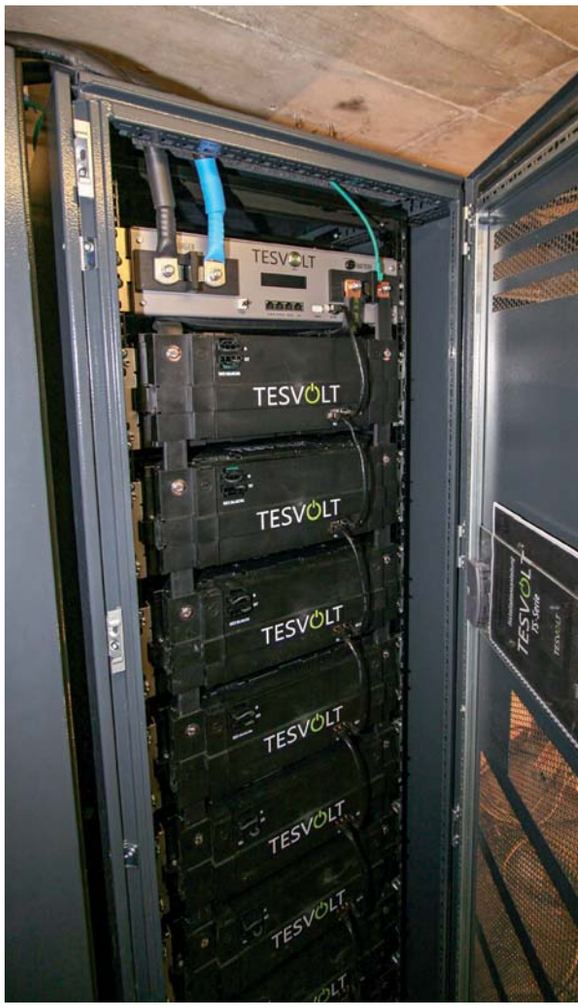
"The standardised and modular components from our product portfolio can be easily combined, providing Tesvolt with extreme flexibility," observes Kühne. And Hannemann agrees: "Our success on the market is mainly down to our agility and comparatively low prices." Ultimately, the high degree of standardisation of the utilised components enables Tesvolt to react quickly to changing market requirements without dramatically raising its prices. Operating on a market with hardly any standards means Tesvolt is able to set its own.

For instance, the start-up offers the TS 8 from Rittal in its portfolio under the name of TS 50. The classic enclosure from Rittal can be placed just about anywhere and is resistant to extreme ambient conditions such as heat, cold or moisture. "In light of their impressive stability, we can integrate battery modules weighing up to 400 kg in the enclosure and still meet the thermal requirements," notes Hannemann.

RESULTS-BASED CONSULTING

Besides the quality of Rittal products, the expert advice from Kühne and his team was another key factor in winning over Hannemann. "We haven't witnessed such vast technical knowledge anywhere else," says Hannemann. This constitutes yet another reason why Rittal has recently become an official development partner of the fledgling start-up. "We now consult Rittal for almost every project. This enables us to – if we need to – perform small changes to the colour, drilled holes and climate control, and put our products to the test in the Rittal test laboratory beforehand."

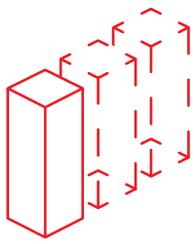
Over the past two years, Tesvolt has increased its availability, reduced its costs and gained hard-won market share thanks to the combination of standardisation, consulting and quality products. Hannemann is well aware of this competitive advantage: "Rittal enables us to satisfy all requirements of the energy storage market. Its solutions have helped us offer competitive prices and deliver consistently high quality." ■



MR FLEXIBLE
Off grid power supply, increased private consumption, load shifting and emergency power – the storage device is suitable for a wide range of uses.

SETTING OFF GRID STANDARDS

In light of the energy revolution, off grid energy storage systems – i.e. autonomous energy storage solutions that ensure an uninterrupted power supply – are becoming ever more important. To deliver large storage systems quickly to the customer, Tesvolt relies on the product portfolio from Rittal. The high standardisation of its solutions enables the required components to be combined in a modular system. As a result, delivery times are shortened and costs are reduced – a key to success on the price and time-sensitive energy storage market.



A SIMPLE WAY TO BOOST CAPACITY

The battery modules built into the large storage systems weigh up to 400 kilograms. To make sure they are stable, Tesvolt uses enclosures from Rittal. The enclosures are exceptionally sturdy thanks to their design and can be easily bayed if necessary. The Active Battery Optimizer developed by Tesvolt ensures that batteries are safely charged and discharged and monitors temperature, voltage and charging status. Thanks to this technology, storage system capacity can be expanded years down the line.

A solid basis for success

BALANCING OUT PEAKS IN CONSUMPTION

Depending on where it is used, the energy storage system from Tesvolt may need to be actively or passively climatised. The climate control solutions from Rittal can do both of these and thus ensure failures do not occur. This is yet another reason why the energy storage solutions from Tesvolt can offer a power supply exactly when it is needed – to balance out peaks in demand, for example. 'Peak shaving' uses battery storage systems to balance out peaks in energy consumption and thus permanently reduce energy costs.

QUALITY DURING EVERY CHARGING CYCLE

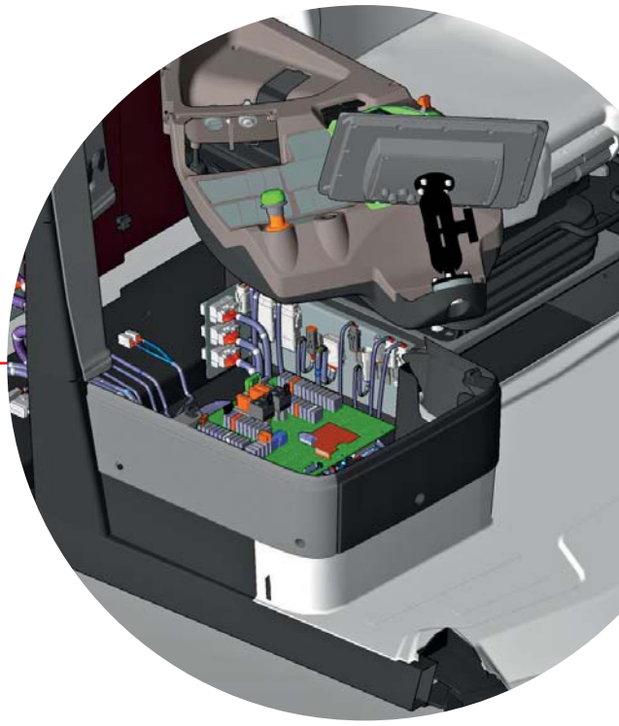
The "made in Germany" seal of quality is also extremely sought-after on the energy storage market. After testing the systems from head to toe with help from Rittal, Tesvolt can now promise its customers their energy storage solutions are fully functional and robust whatever the climate or location. What's more, the storage systems boast a long service life of over six years. This is because Tesvolt only ever uses cells with an exceptional number of charging cycles.

Further information
on the energy storage solutions from Rittal is available at **www.rittal.com/home4energy**

Optimum decomposition

Recycling. Reprocessing with a plan: Eggersmann GmbH uses CAE solutions from **Eplan** for electrical engineering work on its recycling machines. That helps the manufacturer save time and optimise its modular system of components.

Text: Thomas Michels and Beate Schwarz



If you compost your garden waste, you'll know that every now and then you need to grab a spade and mix the layers of compost. That's the only way to ensure the material breaks down evenly and forms a good-quality substrate. In large-scale industrial plants, there are turning machines that take care of that – mounted on caterpillar tracks, they use a rotor to mix the triangular piles, literally moving the lowest layer to the top and vice-versa.

Thanks to its Backhus brand, Eggersmann GmbH is a global market leader in the niche segment of mobile turner technology. After all, only regular turning can get enough oxygen into the compost to improve its quality. Eggersmann has so far built around 1300 machines, which are being used in 78 countries. It was 2012 when Backhus joined the Eggersmann Group, which specialises in the production of mobile and stationary machines and plants for processing and shredding and is thus a good match for the turning professionals at Backhus. "The Eggersmann Group now covers the entire gamut of recycling technology, right up to the construction of entire composting and treatment plants," says Jens Brinkmann, head of the electrical engineering department at Eggersmann GmbH.

UNIQUE TECHNOLOGY
Electrical engineering and electronics are crucial to the turners. Individual modules – such as the cabin or motor unit – are gradually combined to create one overall wiring plan.

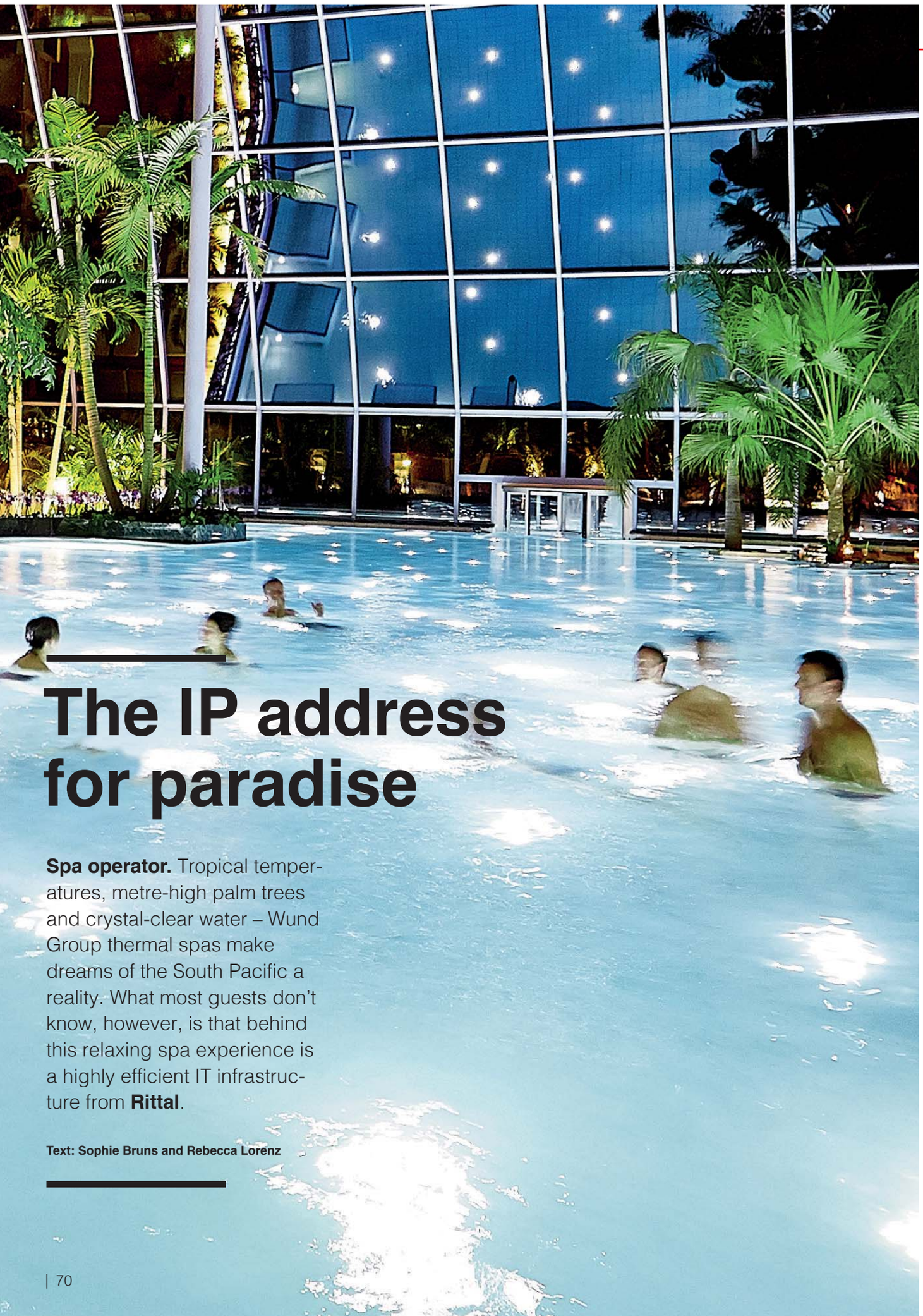
A CHOICE OF COUNTLESS OPTIONS

Production staff manufacture a wide range of machinery on an order-by-order basis – primarily operator-controlled turners with a cabin and a whole host of options for customers to choose from. For example, there are various undercarriages, movable cabins and radio-controlled hose carts for watering the piles. Backhaus also has a solution for automated mixing – the Lane Turner works in enclosed plants and doesn't need a driver.

Electrical engineering and electronics are crucial to Backhus turners – and are becoming increasingly important. Here are two examples: The vehicles are operated via a virtual cockpit that enables rapid diagnostics when irregularities occur. Sensors in the rotor – the actual tool on the machine – measure rotational speed and oil temperature, among other things. There is a wide range of options, both in terms of electrical design – which is carried out in Eplan Electric P8 – and the machines. Brinkmann's plan was therefore to pursue consistent modularisation to simplify electrical design work. The plan was first put into action on the A series from Backhus: "We have created modules for the electrical components of each functional unit such as the rotor, cabin, hydraulic tank, base frame and motor unit and connected these together via interfaces."

The electrical wiring plans of the individual modules are combined into one central overall wiring plan. The structure of the wiring plans has also been changed, with connections mapped out based on functions rather than locations. The same applies to the hydraulic plan, which is created using Eplan Fluid. To simplify the electrical installation, plug-in connectors that can be installed without tools have been defined as interfaces designed for maximum assignment. Brinkmann explains: "Adopting a modular approach has simplified working processes. Modules are prepared and integrated into the machine as ready-made units. That reduces throughput times at the assembly workstation considerably." Electrical engineering with Eplan is automatically compiled in internal documentation that is used as a visualisation tool in production and is utilised even more extensively by the service team.

"Thanks to the introduction of Eplan Cogineer, we can work with just one macro project and we only have to make alterations in that one project, too. In the past, we had several base plans for the various machines," says Brinkmann. Since time and repeat work is saved and the electrical designs can now be reproduced, Eggersmann is extending modular engineering to other applications that are used across several series. "We are using one and the same hardware in various machines such as turners, shredders and, in the future, even screen drums. The differences and variants are produced solely based on the design of the cable harness," points out Brinkmann. Product data management is also being reorganised. The Pro.File PDM solution from Cideon, a sister company of Eplan, is already being rolled out across the board at the Eggersmann Group. The consulting team at Eplan supported the process and provided expert advice. Teams from both companies worked closely together to ensure design, engineering and product data management at Eggersmann were in the best possible position to meet the innovative challenges of recycling technology.



The IP address for paradise

Spa operator. Tropical temperatures, metre-high palm trees and crystal-clear water – Wund Group thermal spas make dreams of the South Pacific a reality. What most guests don't know, however, is that behind this relaxing spa experience is a highly efficient IT infrastructure from **Rittal**.

Text: Sophie Bruns and Rebecca Lorenz

Always on hand

There's nothing like relaxing after a stressful week at work – and where better to do it than the South Pacific? Even more satisfying is when you don't have to fly all the way to Fiji, Tahiti or Samoa to do so. You can also find tropical temperatures, metre-high palm trees and crystal-clear water in Germany, for instance in the 18,000 m² Thermen & Badewelt Euskirchen. No need to worry about visas, vaccinations or flight tickets – a hand towel and bathing suit is all you need here, as transponders and IP addresses work behind the scenes to digitally control the bathing experience.

The armband with a transponder chip given to each guest is an electronic data storage device. It gathers fundamental information – such as duration of stay – and ensures that guests can move about the spa without any cash and nevertheless still be able to pay for drinks, snacks, massages and the solarium. If the armband is held against a receiving device, the integrated RFID chips exchange all the necessary data. This means IT systems need to be fully operational during the opening hours – that's up to 17 hours a day, 365 days a year. High availability is therefore an absolute must for the Wund Group, which operates thermal spas in Erding, Bad Wörishofen, Titisee, Sinsheim and Euskirchen.

Carefully controlled

Take off your jeans and get into your bathing suit. Guests can use one of the 2,400 lockers to safely stow away their clothing and valuables. There is no need for cash, as each transponder armband opens and closes exactly one locker – the one that has the same number as the armband itself. After a quick wash down in the shower, it's off to the baths. Enjoying an internal spa temperature of a snug 33 degrees Celsius, guests can forget about the cold and rainy conditions outside.

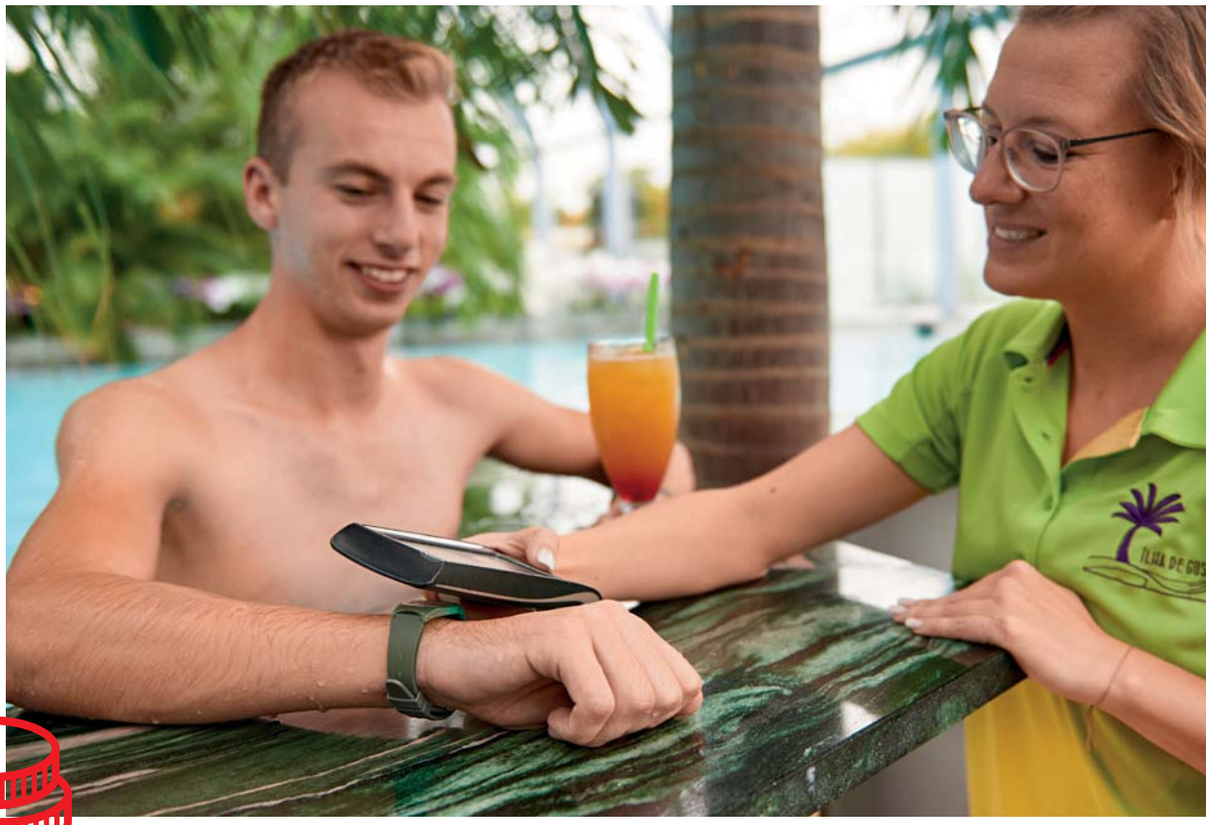
Temperature, humidity and lighting is controlled by IT systems. To counteract fluctuations, values are consistently monitored. After all, guests should never feel too hot or too cold. And because it's not just the guests who are highly sensitive to temperature, but the IT, too,

the CMC III monitoring system from Rittal is used at four of the five WUND Group's locations. Sensors in the server racks monitor the temperature and humidity. The measured values are then incorporated into the RiZone data center management solution and centrally monitored at the site in Munich, meaning IT staff are always equipped to quickly deal with any irregularities.

Reliably looked after

Before diving into the water, most guests treat themselves to a quick snooze. There's no need to rush, as their day in paradise has only just begun. They can choose from the hundreds of white beach loungers to read, take a nap or simply relax. Surrounding them are just under 500 palm trees and around 1,200 orchids. These sensitive tropical plants can take a lot of looking after. But you'll struggle to spot a gardener or watering can.

A cutting-edge, computer-controlled irrigation system takes care of watering the plants. For this to work, each plant is allocated its own IP address, which shows exactly when and how much water each plant has been given. In total, there are more than 3,000 IP addresses in the Euskirchen thermal spa – and the number is growing. Yet again, this requires the IT infrastructure to be as scalable as possible. The required flexibility comes in the shape of highly standardised, modular computer centres from Rittal. The components they contain – from the server racks and cooling units right through to monitoring – can be seamlessly combined and expanded as and when required.



No waiting in queues

Restaurant or pool bar? Water or juice? Pasta or salad? The fruit cocktails are a firm favourite among the guests. But they don't pay for food and drink with cash in the restaurant or bar – that would be time-consuming and impractical. Instead, payments are initially recorded on the transponder armband.

With hundreds of transactions carried out every day, immense amounts of data are generated that need to be processed and held in the local data centre. If this doesn't work, long queues can build up at the till. A stress factor – and for most guests a reason not to come back. To avoid delays, the Wund Group uses autonomous and standardised computer centres from Rittal at four of its locations. They offer short latency times, which enables data to be processed in real time. The Rittal solution offers the required level of availability and stringent data protection, too.

Thoroughly monitored

Off the lounger and into the water – and there's plenty of choice here, too. Thermen & Badewelt Euskirchen has a total of four different swimming pools. Each of them has a different water temperature, ranging from a refreshing 24 to a tropical 33 degrees Celsius. What's more, there are more than 50 jacuzzi-style loungers, four healthcare pools, a diving platform and numerous whirlpools and massage jets. Anyone hoping to try it all out is bound to back for more. After all, there also sauna facilities waiting to be discovered.

IT systems control the temperature of both the air and water. Given its important role for ensuring guests are comfortable, the monitoring system sends an alarm signal as soon as the temperature in the pools experiences a dramatic rise or fall. But besides the guests, the IT is also greatly affected by fluctuations in temperature. That is why Liquid Cooling Packages and cool aisle containment systems from Rittal ensure a constant operating temperature in the data center's servers. If the central monitoring system at the site in Munich nevertheless detects a fault, the staff trigger a continuous alarm system, meaning their colleagues on site can quickly deal with the issue.

Rapid service

Guests at Thermen & Badewelt Euskirchen have ten different saunas and two steam rooms to choose from. There are up to 70 events and sauna infusions spread over the course of the day – relaxation is guaranteed. The transponder arm band registers entry into the sauna area, too. After all, just as is the case with beauty treatments, sunbeds and massages, using the thermal baths is classified as an extra. No cash is needed here, either – customers only have to pay when they leave.

To enable customers to book and use additional services, the IT needs to function perfectly. But were a failure to happen, the spa operator could count on rapid service from Rittal, as no matter which of the five spa locations are affected, Rittal technicians are on site in next to no time thanks to the company's nationwide service network. Regular training means all technicians are experts in maintaining and repairing cooling units and data center solutions. One additional advantage is that the highly standardised components that make up the Rittal solution are available around the clock – including any urgently needed spare parts.

Complete relaxation

After a carefree day, the first guests saunter over to the till. Long queues? Stressed staff? Mistakes on the bill? To avoid all this, the data stored on the transponder armband is read off. Duration of stay, drinks consumed and usage of the sauna facilities – everything is stored and easy to follow. After settling the bill, guests head off into the rain outside and it's not long before they're dreaming about spending another day in paradise.

To ensure guests enjoy every minute of their stay, the IT system works behind the scenes, completely undetectable. And because four criteria are met – central system monitoring, high-quality system technology, maximum standardised IT infrastructure and a nationwide service network – failures are a thing of the past. An important aspect for the spa operator to make sure customers are satisfied – and return. ■

Three questions

Franz Hofstetter
IT Manager of the
Wund Group

Mr Hofstetter, why did you choose IT solutions from Rittal?
Because the IT systems at our five locations are independent from each other even though they are centrally monitored, all potential solutions had to satisfy a minimum of four criteria. We wanted to manage the monitoring and fault messages across all sites, benefit from especially high-quality system technology, standardise the IT infrastructure as much as possible and have access to a nationwide service network. Rittal offers all of these things. In addition, the specialists at Rittal were able to provide us with in-depth expert advice. We always felt as if they understood the challenges to running a spa company of this size and one that had different sites. The fact that, despite the high degree of standardisation, setting up and expanding the IT is as flexible as possible, confirms we made the right decision.

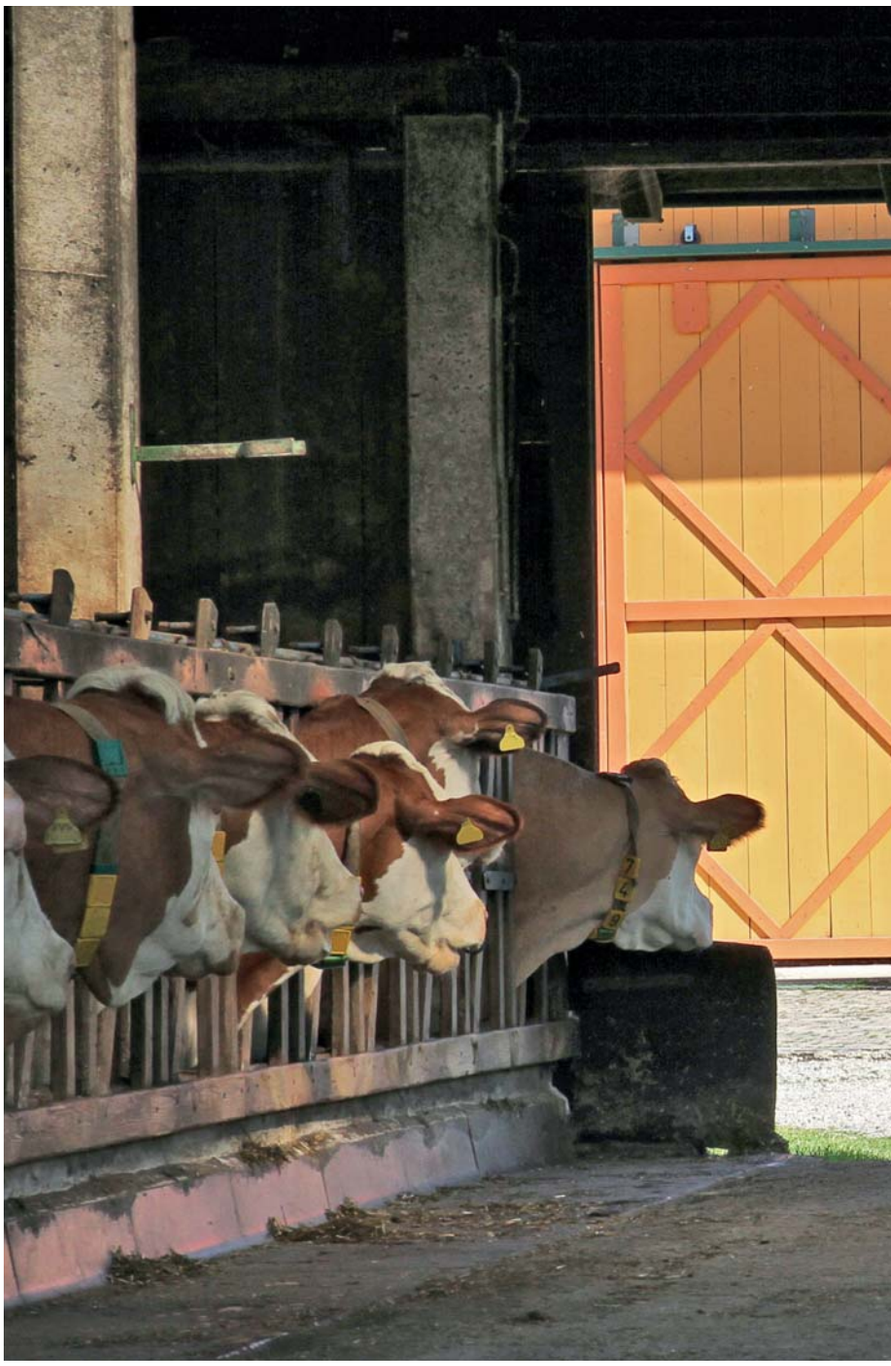
Why did you opt for an edge solution, rather than a central computing centre?
This decision was actually difficult to make. Besides rapid scalability, a central computer centre offered reduced maintenance outlay and high energy efficiency. The edge solution, on the other hand, offered autonomous operation with short latency times and stringent data security. Given that huge amounts of data produced at each of our locations 365 days a year need to be processed in real time, high availability ultimately swayed us. After all, high availability is not a luxury in our spas, but vital for business. Guests have zero tolerance for downtimes and don't want to have to wait long at the till. We could only avoid this by using the autonomous edge solution.

How will you continue to work together in the future?
We are already planning the next steps with Rittal, as ever-advancing digitization means we need to expand our existing IT infrastructure. The racks, climate control solutions and monitoring systems from Rittal are highly standardised, which means expanding our computer centres is not a problem. If we needed to, we could even integrate completely new sites into our IT landscape. Such flexibility has always been important to us and I am delighted that we have finally achieved this. After all, malfunctioning IT would cause long-lasting damage to our corporate image, in addition to financial losses.

Hungry for data

Progress with PLM.
The IT experts from **Cideon** have implemented a new business software at mixer-wagon manufacturer Siloking that enables the company to develop and launch new machines at a faster pace and thus bolster its dynamic growth.

Text: André Schmidt-Carré



The red and blue mixer-wagon slowly rolls through the compact cowshed, passing hundreds of dairy cattle. The electrically driven Siloking eTruck 1408 scatters the fodder at the push of a button. If required, the fodder is disposed from the container at both sides at the same time. The multi-function display shows the driver exactly how much he has distributed. A special software controls the scales to weigh out the perfect amount of feed. For Siloking, the eTruck 1408 is a true stroke of genius. Developers and designers spent two and a half years devising the mobile mixer-wagon – from the idea of the machine and the first trade fair prototype right through to the current pilot series.

It is in part thanks to such outstanding technology that the mixer-wagon experts have been one of the leading companies in the sector for years. The business exports its machines to more than 50 countries and its sales figures have doubled in the past six years. A great success that also presents new challenges. “There were a lot of software systems floating about in the business back then,” recalls Peter Schöttl, Managing Director of Siloking. “Particularly the ERP system couldn’t keep up with our rapid growth.”

A HIGHLY PROMISING SOLUTION
Mixer-wagons from Siloking are used worldwide to distribute dairy cow fodder. Its systems are unmatched on the market, in part thanks to the cutting-edge expert technology.

Switching over to a new, more efficient ERP system was therefore an easy decision. But how should they connect the CAD system to the new software? Originally, Siloking had entertained the idea of keeping the old CAD system and connecting it via an interface to the new ERP. The plan was quickly scrapped, however. “Besides the well-founded advice from Cideon, it was our profitability assessment that swayed us to start using SAP’s PLM at the same time,” says Schöttl. Based on the overall costs, the end-to-end system is more cost-effective and more reliable than a variant with two different programs.

INTERFACES COME SECOND

“There are often practical disadvantages to using interfaces,” explains Cideon’s Principal Consultant Stefan Winzer who implemented the new PLM at Siloking. Data synchronisation between parallel systems is not always stable or reliable, for instance. In the event of error, it often takes a lot of effort to determine the cause. But the fully integrated solution, the Engineering Control Center, does things differently.

The new, unified software architecture encompasses all processes, achieving complete data accessibility throughout the company – from the initial idea for developing a new machine, the design process, procurement and production right through to logistics, sales and customer service. “By switching the ERP and PLM software over to SAP all in one go, we were able to network design, production, logistics and administration and thus achieve complete consistency, from the management board to the work bench,” says Stefan Röder, CAD Administrator at Siloking.

Employees therefore no longer need to copy and enter data into their respective system, but can now simply use the data available and subsequently add their information. Using this method, Cideon is optimising the technical and commercial processes at Siloking. All in all, simplified data maintenance, improved data quality and increased process reliability ensure working processes are much quicker to complete and, to top it all off, less susceptible to errors.

It only takes a quick look at the old ERP, which notably failed to record material transfers, to discover the exact advantages. Many areas were working with different programs and, due to the various standalone solutions, employees in different departments often had to manually transfer data from one program to the other. “Mistakes were common and information was incorrectly linked on a regular basis,” says Winzer, an expert in PLM. “When we were carrying out the project, we noticed numerous irregularities between the data in the different systems.”

In addition, each media disruption that occurred meant more work because the employees in procurement, manufacturing and services often needed to ask the developers where certain data on a machine was located and which version of a component they actually needed to install. “If manufacturing personnel install the wrong components because they have outdated information, that’s a catastrophe wait-

“Even though operations were still running and despite the enormous scope of the switchover, the implementation project was a great success thanks to the experts at Cideon.”

Stefan Röder
CAD Administrator at **Siloking**

ing to happen,” explains Winzer. “This potential for error has now been eliminated, as the designers label currently used parts in the system for all employees to see.”

REVIEWING THE DATABASE

Because the switch was made whilst operations were still ongoing, the utmost care was needed. “The migrated data contained the company’s entire know-how,” says Winzer. Cideon therefore wrote a dedicated program for the Siloking project, which transferred all the data from different source systems and formats into the new PLM, simultaneously deleting any superfluous data. “Only around 15 per cent of the entire database of approximately two terabytes was real data. The rest was just duplications,” Winzer reveals.

It only took a few weeks for Röder and his colleagues to appreciate the benefits of the new system. “We discover new possibilities almost every day,” says Röder. The next step for him is therefore to roll out the new PLM on a global scale. “After 25 years of production and following the transformation of our workshop into the large business it is today, switching over our software was a massive step,” says Schöttl, Managing Director of Siloking. “By performing the switchover, Cideon has enabled us to adapt processes so that we can reliably and efficiently maintain our growth in the future.” ■

SILOKING

Siloking Mayer Maschinenbau GmbH manufactures machinery with innovative fodder mixing technology to meet the needs of dairy farming. Managed by its original founder, the family-owned business employs approx. 350 workers. Its product portfolio includes self-driving mixer-wagons, stationary dispensing systems and distribution equipment. Its cutting-edge agricultural machinery is manufactured at two locations and sold in over 50 countries.

50

COUNTRIES WORLDWIDE
Siloking sells its mixer-wagons in over 50 countries and has already received several awards for its specialist technology.

12 t

CAPACITY
The rear-wheel drive enables even small facilities to use the wagons, which can navigate through tight spaces.

100%

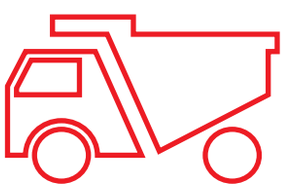
OIL LUBRICATION
ensures the mixer-wagons from Siloking require less maintenance and boast greater reliability.

The new data flow at Siloking

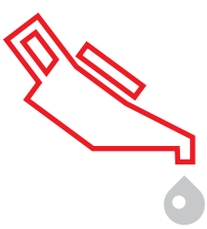
Development and design
Developers work with the Solid Edge integrated software and store the CAD data for machine components in the SAP Engineering Control Center. Once stored, all design and development employees have access and can work on a given project at the same time. After a component has been finalised, the developers create a master material record and release the part for all other employees at the touch of a button.

Production
Once it has been stored, workers in production can access the master record and see straight away which versions of the individual components are needed and whether older versions have since been replaced. They can also access the developers' drawings and plans in neutral PDF format, meaning they no longer need to send queries to the design department.

Purchasing
Procurement staff receive a link from the designers via the SAP system. All the while, they can access all the data required to send enquiries to suppliers about the terms and conditions for the required parts and ultimately to place the order.



Logistics
Staff can add information to the master material record such as storage location, stock level and current orders. All other departments can then easily see when which parts are available.



Service and maintenance
Employees can see exactly which specific components have been installed in a machine, thereby reducing response times in the event of a problem.

ISSUE 02|2018

Real-time mobility

With its automated traffic control, vehicles that communicate and automatic traffic jam and accident warnings, smart mobility is the way forward. Processing the generated data in real time calls for both faster data networks – the new 5G wireless standard – and data processing close to the place of origin. These requirements are all fulfilled by edge data centers, which already combine powerful performance with short latency times and geographic proximity.

FIND OUT MORE IN THE NEXT ISSUE OF BE TOP.

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Sunbathing butterflies

The Common Rose swallowtail butterfly has jet black, warm wings – and right now they're revolutionising the way solar energy is generated. Nanoholes of different sizes in the outer layer of the butterfly's wings scatter and absorb the sunlight. This enables the creature to maintain its body temperature even in cold weather. Science is putting this phenomenon to good use and increasing the use of light by between 90 and 200 per cent by drilling small holes in solar cells.

$2^{77232917}-1$ is the world's largest prime number. The 23,249,425 digits it contains would fill five Bibles. The electrical engineer Jonathan Pace from Tennessee made mathematical history with this finding. His computer took six days to calculate the result, which was published by the Great Internet Mersenne Prime Search (GIMPS) project for amateur mathematicians. Pace won 3,000 US dollars in prize money for completing this calculation.

Bullet bird

From London to New York in two hours – the Blackbird is the world's fastest aircraft. It reached a record-breaking speed of 3,529 km/h over 16 kilometres at an altitude of 24,000 metres in the 1970s, which remains unbeaten to this day. This makes the Blackbird one of the U.S. aviation industry's most successful ever inventions – despite the fact that more than one third of the machines have been destroyed in accidents.

Totally top!

Outstanding achievements are not limited to technology and industry – they also occur throughout nature.

All around the world

Afrikaans, Welsh, Japanese, Greek – Muhamed Mešić (32) speaks 73 languages, twelve of them fluently. The Bosnian lawyer has never taken a language course in his life, but instead uses music, DVDs and independent study. He posts "Travels among languages" reports in the native language of each country he visits on his YouTube channel.

The Full Mounty

An Austrian fireman has managed to climb 82,301 steps in 24 hours. This feat – the equivalent of climbing the Empire State Building 52 times – landed extreme sportsman Andreas Michalitz (49) a place in the record books. He performed this "climbing stairs in full kit" exercise on an escalator in Vienna, carrying 23 kilogrammes of extra weight. He is also the current record holder for running 100 kilometres in full firefighting kit.

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