

# betop

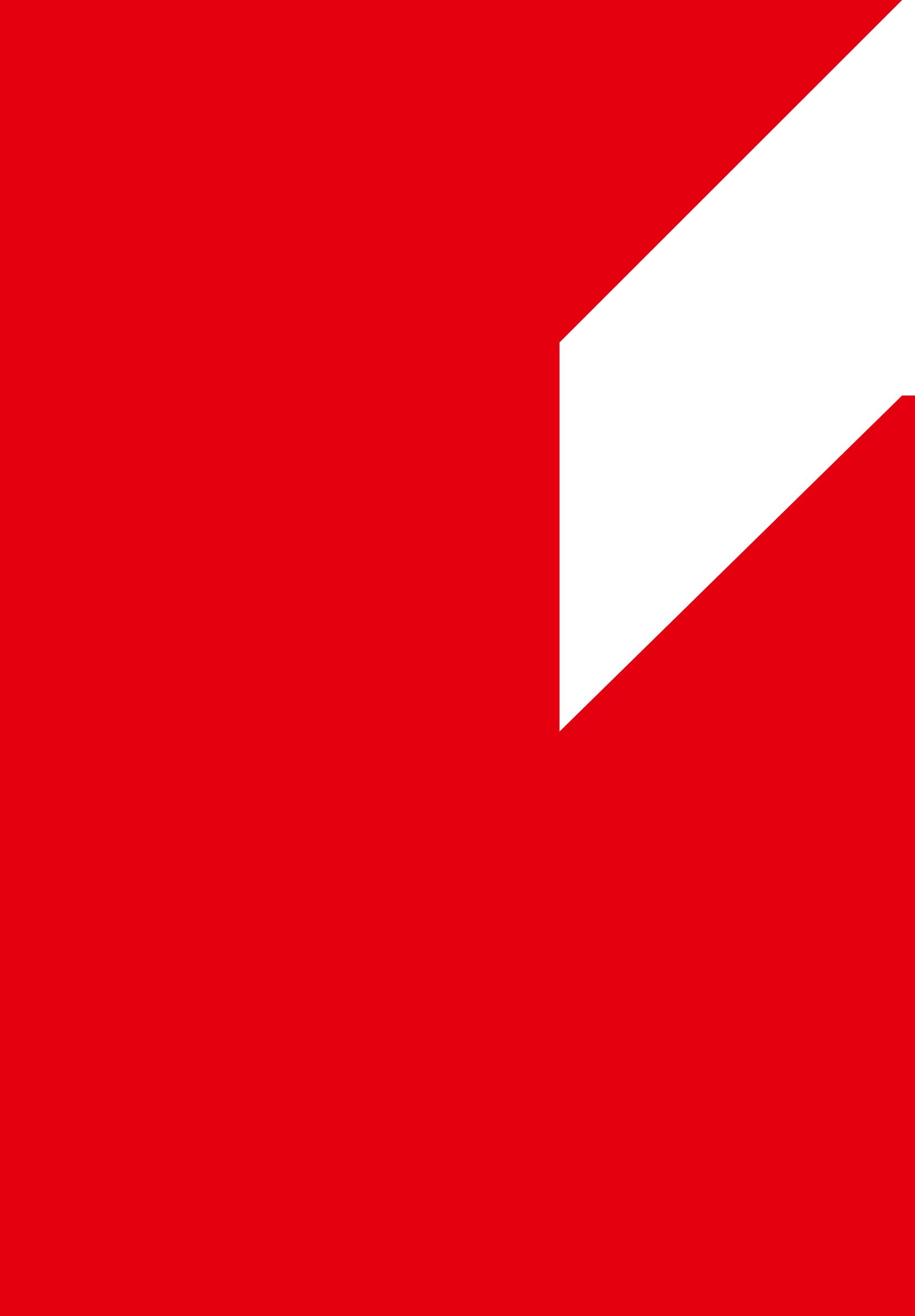
MAGAZINE OF THE FRIEDHELM LOH GROUP

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A black and white photograph showing a man from behind, pushing a massive industrial-style door that is partially open. Light streams through the gap, casting long shadows on the floor and walls. The scene is set in a large, modern-looking industrial or warehouse space.

FOCUS OPPORTUNITIES

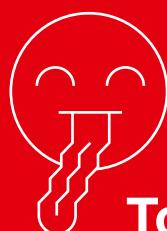
FIRST MOVERS SUCH AS RITTAL AND INNOVO CLOUD  
EMBRACE DIGITAL TRANSFORMATION AND OPEN UP  
NEW WORLDS.





## 14 to 20 kph...

...is the usual speed at which raindrops fall. The bigger and heavier the raindrop, the faster it falls. During a cloudburst, raindrops can even reach speeds of up to 28 kph.



## Tongue twister

The longest place name in the European Union is 58 letters long. Llanfairpwllgwyngyllgogerychwyrndrobwllllantysiliogogogoch on the island of Anglesey in Wales, UK, is home to just under 3,100 people.



## An adventurous first

The first ever book produced on a typewriter was "The Adventures of Tom Sawyer" by Mark Twain during 1872, using a Remington. Previously, books had only ever been written by hand.



## A short hop

The world's shortest scheduled flight lasts two minutes. It connects the islands of Westray and Papa Westray in the Orkney Isles, Scotland, which are a popular destination thanks to their diverse flora and fauna.



## 400 years...

...is how long a Greenland shark can live. It has the longest life expectancy of any vertebrate species. By comparison, tortoises have an expected lifespan of 300 years and dinosaurs lived to a maximum age of 200.



## Miraculous growth

The Eiffel Tower changes in size depending on the time of year. It expands in the summer and contracts in the winter, fluctuating in size by up to 15 centimetres. And it's not alone – all steel structures expand and contract depending on the temperature.

# New worlds are opening up

Dear readers,

When is the right time for your idea, innovation or product? 'First movers' know. These aren't just the first to come up with an innovation, they also take the next step at precisely the right time and open up new worlds.

We're talking about timing – like when a sportsperson makes a great move or an orchestra plays in perfect harmony. That calls for a mix of talent, expertise and experience.

As an entrepreneur, I find it infinitely more difficult to find the right timing – something I am sure you can relate to as a part of the wider economy. We live in a world that is becoming ever more complex. Pioneering decisions have to be taken based on incomplete information, which is why Paul Saffo considers intuition to be extremely important. In this edition, Saffo, a professor and futurist from Silicon Valley, gives us an insight into his views on the digital transformation.

First movers have an entrepreneurial feel for what new developments customers need. They also have the courage to go for it when they feel the time is right.

That is precisely what we do. And we encourage you to do the same. It requires a great deal of stamina, as innovations can also fail – particularly in the preparatory stages. However, we have learned to learn from our mistakes. What's more, if the end product is perfect, then we can surely accept a bumpy journey along the way.

The Friedhelm Loh Group took steps years ago to get to grips with the digital transformation. And our digital journey continues, day by day. The new Rittal plant in Haiger, which is highly automated and networked, represents an important milestone. From order placement through production to delivery – we have taken availability and speed to the next level. In this issue of *be top*, you will be among the first to explore the plant.

Also showcased in this issue is the IT ecosystem from Rittal and Innovo Cloud. We have created a unique system in IT, too, by bridging the digital and physical worlds in the sector and pursuing intelligent collaboration between partners. This offers similar potential to the opportunities that Rittal and Eplan have unlocked in panel building and switchgear engineering. The end result is that whole new worlds are opening up for our customers, offering countless ways to create added value.

I recommend the latest edition of *be top* to you. In it, you will find lots of real success stories that show how companies can get the best out of digital transformation. I hope you enjoy reading them!

Yours,



Professor Friedhelm Loh



## **Professor Friedhelm Loh**

Owner and CEO of the Friedhelm Loh Group

# Contents

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## EXPERTISE

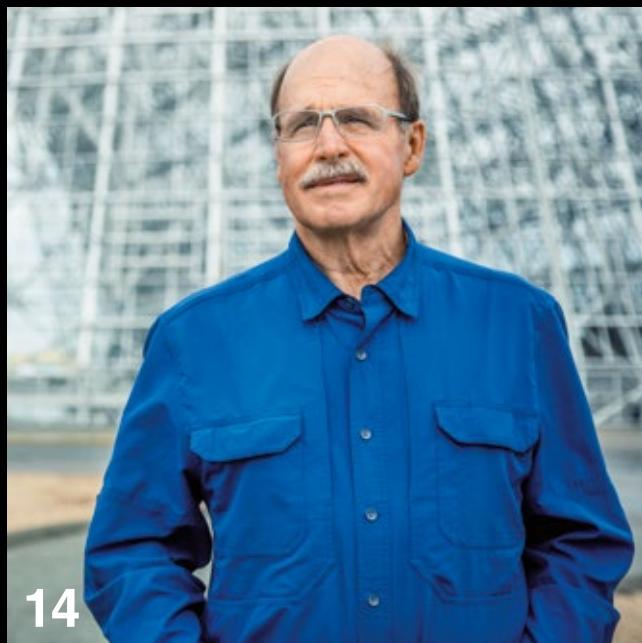
26

### STRONG TOGETHER

Perfectly coordinated software and hardware solutions open up new growth potential for plant engineers.



## COVER STORY



14

### “THE DIGITAL TRANSFORMATION IS LIKE CATCHING A WAVE”

The digital transformation is placing huge challenges on companies around the world. In this interview, trend researcher Paul Saffo explains the best way of overcoming them.



WATCH THE RECORDED INTERVIEW  
IN THE ONLINE MAGAZINE!

### NETWORKED WITH THE WORLD

Rittal is entering a digital future with its new plant in Haiger – and that's reflected in the products manufactured there.

36

### CONTROLLED POWER

How artificial intelligence at the Budarhals hydropower plant is preventing downtime.

38

### PARTNERS IN VALUE CREATION

Modular data centers with integrated cloud connection from Innovo and Rittal offer infinite possibilities with maximum flexibility.

42

### TAILORING THE PROCESS TO THE CUSTOMER

Optimised processes are set to ensure LKH can continue to meet all customer requirements.

44

### SMART POWER SYSTEM

How Ri4Power ensures reliable, uninterrupted power distribution in switchgear.

## EXPERIENCE

46

### A STRATEGY FOR THE EAST

Stahlo is building a cutting-edge plant at its Gera site to ensure it can continue to supply the fast-growing steel markets in eastern Europe.

48

### FULLY CHARGED

Rittal is supporting electromobility with premium enclosure technology – from power generation through to the charging station.



52

### DIRECT CURRENT FOR SMART PRODUCTION

Researchers and engineers are working on using direct current in energy supply. Daimler is using the new process for the first time in the construction of a vehicle production plant.

## COMMITMENT



56

### TRAINING WITH A FUTURE

Thanks to the Learning Factory, apprentices at the Friedhelm Loh Group can try their hand at operating state-of-the-art machinery and get to know digital processes.

62

### DIGITAL FORT KNOX

thyssenkrupp Steel is using Data Center Containers from Rittal to modernise its production-relevant IT.

66

### THE DOOR-OPENER

Boon Edam is bringing on board experts from Cideon to help it standardise its database.

68

### REALLY SAVING ENERGY

A Blue e+ chiller from Rittal is helping to reduce power consumption on a test bench at Bosch Rexroth.

70

### IT INFRASTRUCTURES FLOURISHING IN CHINA

Countless hyperscale data centers are springing up in China with support from Rittal.

72

### EFFICIENT CONSULTATION

Eplan is offering its users a customised solution for process optimisation in the shape of Eplan Experience.



74

### A SAFE TAKE-OFF

Airbus in Finkenwerder uses Blue e+ cooling units from Rittal to stop its test hardware overheating.

A graphic element consisting of a red rectangular banner. On the left, there are three electronic devices: a laptop, a tablet, and a smartphone, all displaying the same website content. A white cursor arrow points towards the devices. To the right of the devices, the text "Brand new!" is written in white. Below the banner, there is a block of text and a URL.

be top is now also available in an online version you can read on the move, including exclusive extra content. It is the digital home for the latest news from the worlds of industry, commerce and wider society. Relevant topics, plenty of pictures and exciting multimedia formats, all packaged up with social sharing – it's the ideal, on-the-go format.

<https://betop.friedhelm-loh-group.com>

## STANDARDS

03 EDITORIAL

06 SNAPSHOTS

12 AROUND THE WORLD

24 MAGAZINE: EXPERTISE

54 MAGAZINE: COMMITMENT

60 MAGAZINE: EXPERIENCE

78 PUBLICATION DETAILS

79 PEAK PERFORMANCE – BE TOP!

### Your opinion matters

Do you have any questions, suggestions, praise or criticism about the current issue? Simply email the editorial team at: [betop@friedhelm-loh-group.com](mailto:betop@friedhelm-loh-group.com)



## SNAPSHOTS

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# Wood that sounds good

Italy is famed for its passion for good food, emotional football and musical finesse. Indeed, the region around Milan is steeped in culture and has played a big part in shaping the history of the violin, being home to prestigious makers such as Stradivari, Amati and Guarneri del Gesù. Some 125 years ago, **Angelo Cremona S.p.A** in the nearby city of Monza started to specialise in woodworking machines. Back then it was a pioneer and, to this day, the long-standing company is still leading progress. A satisfied customer of the TS 8 enclosure from Rittal, Angelo Cremona has become the first company in Italy to roll out its successor, the VX25.

► [www.angelo-cremona.com](http://www.angelo-cremona.com)







#### SNAPSHOTS

## A clean delight

A juicy hot dog, crisp on the outside and soft and smooth on the inside, wrapped in a slightly sweet roll and smothered in an array of toppings – it's the trademark snack of North America. Canadians love them and are particularly partial to them at sporting events such as ice hockey matches and baseball games. To achieve product quality of hot dogs, the hygiene has to be top notch, too. That is why a Canadian food producer uses Hygienic Design enclosures from Rittal, which ensure clinical cleanliness and reliability – two critical considerations in food production.



## SNAPSHOTS

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## Tradition meets technology

Row upon row of solar panels have taken up residence where fishermen once went to work. In many parts of China, it is not unusual to stumble on a sea of photovoltaic plants. One of China's leading thin-film solar cell suppliers is **Hanergy**. These thin-film solar cells are much lighter than normal solar panels and more flexible. Hanergy uses Eplan engineering software and a Perforex system from Rittal Automation Systems in the manufacture of its products.

► [www.hanergy.eu](http://www.hanergy.eu)



# Global solutions

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



**75%**

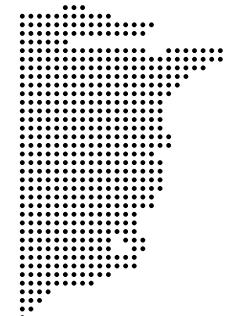
A good beer is only as good as its temperature. International drinks maker **GRUPO MODELO** has been using Rittal products for years. After evaluating the cooling units in production, Rittal Service replaced the installed components. The 85 new Blue e+ cooling units are provisionally being used on three of the twelve production lines, where they provide a more energy-efficient cooling solution and help prevent downtime in the plant. The brewery, which produces drinks including the world-famous Corona, is set to save up to 75 per cent on its energy consumption.



**CANADA**

## Two for three

One of the biggest names in variable frequency drives, motor control centres and industrial current conversion technology, **3 PHASE POWER SYSTEMS INC.** in British Columbia, Canada, recently rolled out automated 2D and 3D planning. In a bid to complete projects faster and reduce sources of error, the electronics supplier switched from its previous E-CAD system to the two solutions Eplan Electric P8 and Eplan Pro Panel.



**SWITZERLAND**

## The sound of savings

Efficient cooling and lower energy consumption – that is what the Swiss Cooperative Society of Authors and Publishers of music, **SUISA**, achieved with Liquid Cooling Packages (LCP) from Rittal. The LCPs in the new data center in Zurich use cold water as a cooling medium and can cope with heat loads of up to 55 kilowatt hours per rack. The CMC III monitoring system from Rittal is also being used as an early fire detection system.

FINLAND

# 1,680

completed projects and 25 years of experience make **APEX AUTOMATION** in Finland a well-established supplier of turnkey automation solutions. The company uses standardised electronic engineering in its work. Eplan Cogineer and newly established macro libraries boost efficiency by automating the creation of technical, hydraulic and pneumatic documentation.



NETHERLANDS

## Going with the flow

Water supply networks represent one of the most far-reaching infrastructural advances of the last 100 years. Every day, 5.5 million people use the services provided by **VITENS**, the largest waterworks in the Netherlands. Vitens is pursuing digitalization as it seeks to make drinking water supplies even more reliable. As part of that process, it has fitted out a section of the pipeline network with sensors that document, among other things, water pressure capabilities to prevent complications in the drinking water supply. The necessary measurement data is accommodated in dependable Rittal Outdoor enclosures.

INDIA

## Strong performance

Smartphones, tablets, laptops – almost every electronic device incorporates one or more circuit boards comprising insulating materials and conductive connections. One of the world's leading circuit board manufacturers is **AUSTRIA TECHNOLOGIE & SYSTEMTECHNIK**. AT&S is a supplier in the mobile sector, automotive and industrial electronics and medical technology. The company wanted to overhaul the data center at its site in India because it had fallen behind standards for reliability and energy efficiency. The outmoded cooling and security system was one of the main reasons it chose solutions from Rittal. Once Rittal had remedied the network errors, the staff on site implemented the Edge Data Center.

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# “Digital transformation is like catching a wave.”



**Onwards and upwards.** Silicon Valley forecaster Paul Saffo on why no industry can avoid the immense challenge of digital transformation — and how to emerge victorious.

Text: Steffan Heuer

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**PAUL SAFFO**

Saffo is an American technology researcher and one of the most respected voices on the digital future. He is based in Silicon Valley and is a professor at Stanford University and Singularity University. His courses focus on the future of engineering and the effects of the technological transformation. For over three decades, he has been helping companies and governments understand and respond to the dynamics of significant, long-term changes. Saffo is the author of several books, including 'Dreams in Silicon Valley' and 'The Road From Trinity'.

# M

**Mr. Saffo, let's start with a definition. What is digital transformation? Or is it a catch-all term like artificial intelligence that's open to interpretation?** Digital transformation is not so much a definable term as a polite expression of the terror companies are going through right now. It's a moment in time where digital technology is changing everything, and as people are trying to understand it they throw a label on top of it. Digital technology is the solvent leaching the glue out of our business infrastructures, our organisations and our governmental entities. This moment reminds me of the early 16th century with the invention of moveable type and the publication of the first book. Print technology launched a revolution that transformed business and culture across European society. Today, the equivalent is bits. Digital technology, which was launched just about 70 years ago, is gaining traction now, and the revolution in terms of impacts is beginning.

**How much of that is a shift in mindset and how much is a technological change?** First we invent our technologies, then we turn around and use them to rein-

vent ourselves as individuals, communities, and cultures. The anxiety, uncertainty, and opportunity we see stem from how we respond to the opportunities presented by those technologies. Make no mistake, this is a business revolution. And revolutions have losers and turbulence. We'll see lots of businesses go out of existence, and we'll see lots of businesses emerge that were never possible, as well as that third category – the incumbents who survive are the businesses who transform.

**When people talk about digital transformation, they often use the word disruption in the same breath. Does transformation require disruption, or does disruption require transformation?** Disruption is what you hope happens to your competitor; transformation is what you hope happens to you. These are words that draw our attention to things that are otherwise overlooked. So the words have less meaning than they have value as an indicator of something to watch out for.

**When most people think of digital transformation, they probably think of companies such as Google, Facebook, Apple, Amazon. Does Silicon Valley play a crucial part in that transformation?** The interesting thing about Silicon Valley is that it reinvents itself about every decade or decade and a half. That's how it manages to stay at the centre of the revolution even though each phase of the revolution is very different. The Valley is typically the first place to take advantage of new, inexpensive technologies because innovators are the first to understand what they really are good for. In the 1970s, microprocessors got really cheap. The result was the personal computer revolution, and that lasted for about a decade. The next phase was ushered in by the arrival of cheap lasers in the late 1980s, which led to the networking revolution of the 1990s. The poster child for this access revolution was the world wide web. The transformation today is about something very different. It's not about commerce, and it's not about the Internet at all.

**So, what is it about?** This moment in time is being shaped by cheap, ubiquitous sensors. We're connecting our computers and our networks to the physical world. We're asking them to observe and manipulate it on our behalf. The real driver of the next wave of business transformation is how to integrate environmentally aware machines into your business – whether it's in the form of output devices like 3D printers or input

## TRANSFORMATION

Rittal sees itself and its sister companies as architects of the digital transformation – both their own and that of their customers. The company focuses in particular on the digital integration of value chains. "For example, modern panel building and switchgear engineering is about more than just getting a high-quality product on the assembly line on time," says Uwe Scharf, Managing Director Business Units and Marketing of Rittal. "The industry relies on speed, error reduction and traceability, so digital services are indispensable."

## REINVENTING YOURSELF

At Rittal, reinventing yourself means continuously digitizing in-house and customer processes – whether it's ordering and production processes, or product and service offerings. At Rittal, digital integration is carried out vertically from the ordering process, product development and networked planning to manufacturing and customer service. On top of that, data is integrated horizontally with suppliers, customers and other value creation partners.

## SMART MACHINES

Rittal recently launched a new highly automated plant. To ensure end-to-end automation, Rittal uses automated guided vehicles, for example, which use sensors to read their surroundings, meaning they always know where they are in the plant and can respond to pedestrians. Read more about the plant from p. 30.

devices like sensor networks... it all comes down to that nexus. Artificial intelligence (AI) today is about creating software that connects with vast sensor networks and does what we could call cognitive computing. I'm always wondering when the first company will be listed on a stock exchange that has no employees and is run by such autonomous software.

**How far are we from this sensor-rich world powered by AI?** This is not a forecast, this is present tense. It's happening today. Think about it. We are replacing our incandescent, fluorescent lightbulbs with LED-based lighting. An LED is not merely a device that emits photons. Every LED is capable of also being a sensor. Every light that goes into a business or a house will also be a sensor doing other things. So we're talking about a very deep, tightly woven mesh of sensor technologies and computers that will be surrounding us.

**Are today's successful tech companies just providing the tools for this next transformation, or are they also transforming themselves?** The companies that look like they're on the lead to this transformation are actually doing exactly what all the rest of us are doing – they're trying to flee into the future as fast as they can. They have no idea whether they will succeed. But the one thing they know is they better not slow down.

**So it comes down to timing...** Since we are in sunny California, I want to say that I was, once upon a time, a surfer. Playing with digital transformation is a little like catching a wave. If you start paddling too soon you will be tired by the time the wave arrives. It will leave you behind and you'll look ridiculous. On the other hand, if you're not paying enough attention and you don't happen to notice the wave until it's almost on top of you, you will get crushed by it. So paying attention to how the technologies arrive and when they arrive is crucial. Keep in mind that sensors, the modern wave of sensors, started in 1994, but it hasn't really had an impact until the last decade. The transistor was invented in 1947 and it didn't even start deploying until the early 1950s, and the computer revolution was two decades later. If you want to understand the technology origins of the wave that will eventually reach you, look for the technologies in the early phase and add 10 to 15 years and say: I know it will take that long. What will it mean for me in 10 to 15 years? ▶

**"The interesting thing about Silicon Valley is that it reinvents itself about every decade or decade and a half. That's how it manages to stay at the centre of the revolution."**



**Digital pioneer**  
**Paul Saffo**  
**puts things**  
**very clearly**  
**for be top:**  
**He gives**  
**examples**  
**of companies**  
**that have**  
**recognised**  
**and harnessed**  
**the potential**  
**of the digital**  
**transformation –**  
**and those**  
**struggling to**  
**adapt. Digital**  
**frontrunners**  
**have one thing**  
**in common –**  
**they have the**  
**courage to**  
**break away**  
**from old**  
**approaches in**  
**favour of true**  
**innovations.**

AMERICAN AIRLINES

## The pioneer

“ One of my favourite examples of a successful digital transformation is Bob Crandall of American Airlines. He was working there in the 1950s, when the company developed its first digital reservation system, and played a crucial role in ensuring American Airlines continued expanding this technology through the 60s and 70s. He eventually became CEO of the airline.

During the oil crisis in the 70s, American Airlines made a loss with every seat sold due to high fuel prices. But they had this new reservation system, called SABRE, and that helped them make money on every booking. It was then that Bob realised that his business had actually become a computer company. The airline was making losses so that it could generate sales with its IT systems.”

**SABRE** (short for ‘Semi-automated Business Research Environment’) separated from its parent company American Airlines in 2000 and is now an independent company that processes bookings for 400 airlines, 220,000 hotels, 42 rental car companies, 38 railways and 17 cruise lines. SABRE describes itself as an ‘innovative technology company’.

**ESTABLISHED:**

In 1930 as a joint venture between 80 regional airlines for transporting post rather than passengers. According to AA, its maiden flight took place as early as 1926.

**HEAD OFFICE:**

Fort Worth, Texas

**EMPLOYEES:**

126,600

**SALES:**

\$42.2 billion

APPLE

FEDERAL EXPRESS

KODAK

## The ruthless one

**“** Anyone who owns a profitable business, shouldn't have any qualms about divesting it. In other words – sacred cows make the best burgers. Companies should take a close look at what is at the core of their business and understand what makes it so valuable. After all, that's exactly what a competitor is looking to imitate. Therefore, it's better to slaughter your sacred cow before someone beats you to it.

My favourite adopter of this approach is the founder of Apple, Steve Jobs. Let's think back to 2007 when the iPhone was unveiled. At this time, the Apple iPod was the best-selling product with steadily growing sales figures. And what does Steve Jobs do? He puts all the iPod's functions into the new iPhone, essentially destroying his iPod business in one fell swoop. But he knew he had to act before someone else beat him to it, and this allowed Apple to siphon off this revenue. That's how ruthless you have to be with old business – regardless of how profitable it may be.”

**!** When the iPhone was launched in January 2007, the mass market for smartphones with touchscreens was created overnight – a concept that every mobile phone manufacturer then emulated. Over the next decade, Apple sold over a billion of these devices and, despite growth reaching a plateau, the iPhone still accounts for 90 per cent of the profit of the entire mobile phone industry.

**ESTABLISHED:**  
As Apple Computer Company in 1976, Apple Computer Inc. in 1977, and Apple Inc. since 2007

**HEAD OFFICE:**  
Cupertino, California  
**SALES:**  
\$265.8 billion  
**EMPLOYEES:**  
132,000

## The expedient one

**“** While studying economics at Yale, Fred Smith, who founded Federal Express in 1971, wrote an essay that has since become famous because it essentially outlined the business plan for a company called Federal Express. His ingenious idea was to apply digital transformation to logistics – in other words, treating packages like bits. All conventional courier services took a somewhat different approach – they transported deliveries from a small town to a central hub in a major city then to a regional centre, meaning each package often had to be unloaded and reloaded unnecessarily often on its way to its destination.

It suddenly occurred to Smith that loading goods onto a plane was the biggest cost factor, and so he developed a 'hub and spokes system'. If I ship all packages by air to a central hub – in Memphis, for instance – and then distribute them directly to the destination from there, then I've completely reinvented the courier business.”

**!** Federal Express is now one of the world's largest providers of logistics services, delivering over 15 million packages in over 220 countries and territories every day. Like its competitors, the company has refined a data-driven hub and spokes system that benefits from the enormous growth in online commerce.

**ESTABLISHED:**  
1971

**SALES:**  
\$65.5 billion

**HEAD OFFICE:**  
Memphis, Tennessee

**EMPLOYEES:**  
227,000

## The radical one

**“** No one uses Kodak digital cameras anymore because we all have smartphones. But Kodak was a digital pioneer – however unbelievable that may sound. It developed the first digital camera and manufactured the world's most advanced CCD chips. What brand comes to mind when you think of high-performance photography? Leica! The Leica M9 camera had a Kodak chip – and that was already a decade ago. That's how well Kodak understood this technology.

Its fatal mistake was the transformation of its business model. When the CEO decided to develop the first digital camera, he knew that the days of emulsion film were numbered. The managers that followed him were also in favour of the digital transformation and had a team of innovators, who developed a solution for this. Kodak was ultimately doomed by the lack of understanding of middle management employees, who were reluctant to give up on film. Kodak had the technology, the vision, the right leaders, and ideas for new products. But there were many mid-level employees who didn't want change and stood in its way.”

**!** As early as 1900, Kodak launched the first mass-market camera – the "Brownie". It went on to become a global sensation, enjoying decades of success – until the fatal decision was made in the 70s and 80s to forgo the digital camera so as not to jeopardise the company's core analogue business. The transition to digital photography came too late. Kodak went into administration in 2012 and is now trying its hand as a printing specialist.

**ESTABLISHED:**  
1988

**SALES:**  
\$1.5 billion

**HEAD OFFICE:**  
Rochester, New York

**EMPLOYEES:**  
5,800

“For companies run by their founders, there is much more at stake than for those run by managers. Therefore, they will be inclined to not question what the founder says.”



**PROUD FOUNDER** Prof. Friedhelm Loh, Owner and CEO of the Friedhelm Loh Group is unveiling a world-first for enclosures – the VX25.



**Doesn't surfing require a certain level of youthfulness, agility and flexibility? What about old companies that have large supply chains and bureaucracies?** Being a good surfer, like many sports, is about being good at physics and not about youth and strength alone. The same is true for business. It's all about frame of mind and understanding the physics of innovation. The challenge with established business is more often than not that they know exactly what's ahead, they can hear the sound of the downstream waterfall that their boat is about to go over. They think, we're going to get out, shift over, but let's just make a little bit more money out of our existing line of business. That's the most dangerous thing a company can do.

**How would you counsel a medium-sized business that doesn't think of itself as closely connected to Silicon Valley and cutting-edge technology?**

This applies whether you're a large company, a medium company, or a very small company. A family business, a mid-size enterprise, or public company. It's all the same. The answer is to think like a competitor, and especially think like a competitor who's an innovator. Looking over the fence at your own business saying, I want a piece of those revenues and I'm going to get it not by competing against them but by completely transforming the playing field. Apply that to your own business.

**What does that mean in practical terms?** There are lots of different ways to do this. Pick a small team, what in the military is called a red team, to look at your business and say how would they compete against it. Try whatever works with your culture. But at the same time, do not overplay the belief that those folks are actually going to get the answer. Innovation is a very difficult process. In the biological world, the term for innovation is mutation. And mostly it's lethal. And that's why species only do it when they're under stress. The challenge of digital transformation faces every company from the very largest to the smallest little start-up.

**Is there such a thing as a playbook for how a company can approach transformation?** There's no playbook for this. There might be playing cards with ideas on them that you can shuffle around and organise for your organisation. At the end of the day, the most important quality, ▶

## INNOVATION

**As a close technological partner with its customers, Rittal took a long hard look at the lifecycle of its core product – the enclosure – and the process steps of its customers and users in preparation for its digitalization initiative. "As a result, Rittal now offers enclosures and end-to-end digital solutions for each additional process step taken by customers and end users," says Uwe Scharf, Managing Director Business Units and Marketing of Rittal.**

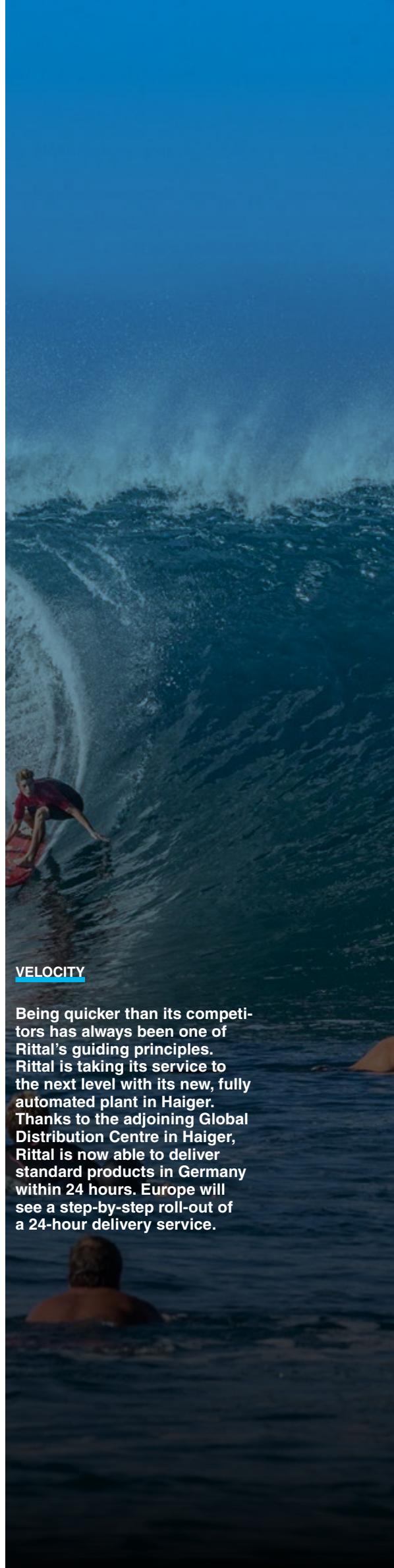
inclined to not question what the founder says and follow the founder's intuition more readily than if you have a big-bucks CEO dropped into a company to lead digital transformation.

**Digital transformation often creates resistance in an organisation because employees are worried. How can a company best address these fears?** Human resistance to change is the biggest problem – because change is terrifying. The secret to Silicon Valley's long-term success is that we've made it a safe place to fail. Failure has consequences but they're not lethal. In companies, if you can make it a place where it's safe enough to fail, that people don't freak out, then change will go a lot more smoothly. But you have to start at the point of admitting that "I know people hate change." If you can take something strange and make it seem familiar, that helps for acceptance. But then also to turn around and take something that is already familiar and make it seem strange. Here's this new technology, it's actually tied to our business, it's more familiar than you might think. Then take a familiar thing, that line of business that's been a cash cow for generations and say: Hey, it's actually not what we think it is and not what our business is. Do those two things at once, and it knocks people off balance so you can effect change.

in my opinion, for an executive, or even a young employee, is intuition. The whole point of understanding the history of earlier innovations and the environment the company's in and the potential changes is to get yourself to a place of robust, well-informed intuition where you can make the right decision based on incomplete information and act without looking back. Knowing that moment when you have to decide there's no turning back and you have to move quickly – that is the single most important skill a senior executive can have.

**Doesn't the size of the company make a difference when arriving at such a momentous decision?** I don't believe there's a huge difference between big companies and small companies, but there is a major difference between a company that's led by a founder versus a company that's led by professional management. You can have professional managers and CEOs who are as visionary and as brilliant as founders, and in fact often they are more visionary or more brilliant. But a founder, whether they're right or wrong, has one advantage that professional management never has. And that is everybody in that company knows – no matter how hard they're working and how much they have at stake – the founder has more at stake than they do. Therefore, they will be

**Why should companies under pressure to transform focus on those intangible values?** We are at a moment in the 21st century where velocity and rapid response are everything. I think advantage goes to the companies that can accommodate all that short-term stuff, but hold the longest timeframe as their private goal. How do we do things today that won't pay off for 20 years? But do it in a way that we will still be here in 20 years when they do pay off. That's the hardest management challenge of all. At the end of the day, it's the only challenge that matters. ■



## VELOCITY

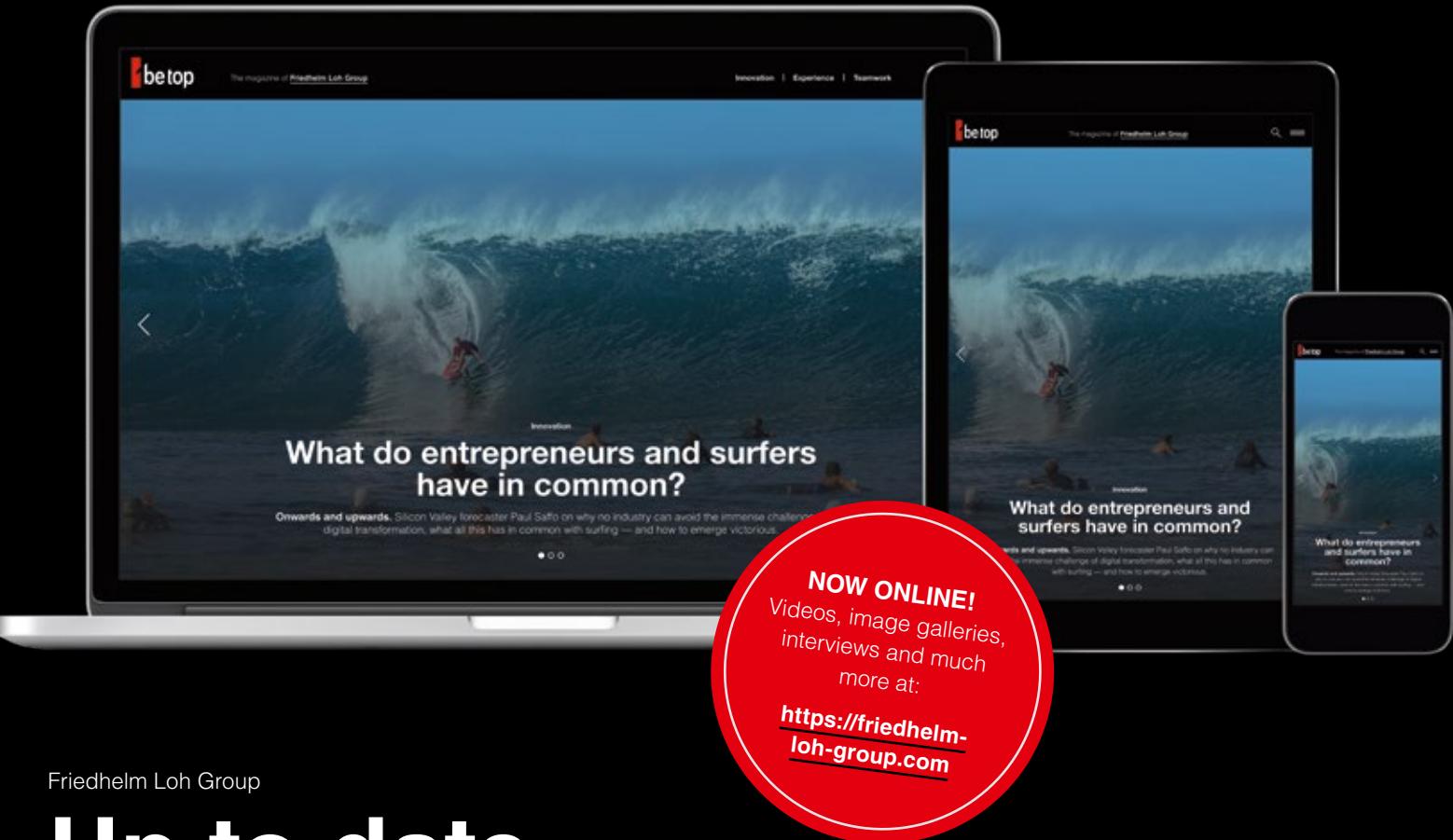
**Being quicker than its competitors has always been one of Rittal's guiding principles. Rittal is taking its service to the next level with its new, fully automated plant in Haiger. Thanks to the adjoining Global Distribution Centre in Haiger, Rittal is now able to deliver standard products in Germany within 24 hours. Europe will see a step-by-step roll-out of a 24-hour delivery service.**



Watch Paul Saffo answer further questions about the digital transformation in this video.  
[www.bit.ly/betop-interviewsaffo-en](http://www.bit.ly/betop-interviewsaffo-en)

**At the end  
of the day,  
the most  
important  
quality,  
in my  
opinion,  
for an  
executive,  
or even a  
young  
employee,  
is intuition.”**

# EXPERTISE



Friedhelm Loh Group

## Up to date

Digital revolution, automation, Industry 4.0 – be top has gone online. You can now read fascinating insights into our expertise, customers and experience on your tablet, smartphone or other digital devices.

Find out more about the Friedhelm Loh Group, explore the fascinating background to topics covered in be top and delve into exciting trends in the new online magazine. The digital revolution is in full swing, and it is more than just the products that are going digital at the Friedhelm Loh Group – be top is moving with the times, too. The new cutting-edge company magazine can be found online at [www.betop.friedhelm-loh-group.com](https://www.betop.friedhelm-loh-group.com), where it offers a stunning array of digital news offerings. Added extras relating to articles in the magazine, web videos and previous editions can all be accessed easily from anywhere on a tablet, smartphone or computer. The online

magazine that accompanies be top provides information in an easy-to-follow format, going into more detail where necessary and offering a point of reference as the digital home for the latest news, new visual worlds and multimedia formats combined with social sharing and feedback channels – ideal for reading on the move. In the age of digital transformation, it is becoming increasingly important to focus on valuable background information. Readers can explore a wide range of topics as the webmagazine aims to reach a broad audience with all the latest on industry developments, best practices, and stories from all industries.

**+++ Mike Freund is the new President of Rittal North America LLC. +++**

## IN BRIEF



Promotion

### New Managing Director at Rittal

Uwe Scharf has been Managing Director at Rittal since 1 January 2019 and is responsible for the Business Units and Marketing. "He has outstanding experience in business development and the strategic alignment of product and system operations," says Dr Karl-Ulrich Köhler, CEO Rittal International. Scharf joined Rittal in 2001. Prior to his new position, the 55-year-old was the Executive Vice President of Global Business Unit Industry.

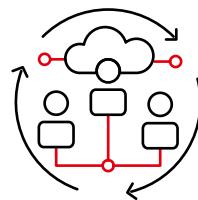
Engineering cloud

### Finger on the pulse

In launching its new business unit, the international software specialist Eplan is not just making in-house changes, it is also pursuing a promising market trend. Eplan ePULSE is lined up to be the cloud-based nucleus of interdisciplinary and cross-interface work carried out by engineers around the world. The open, cloud-based system covering the current portfolio of the

Eplan Data Portal, Eplan Cogineer and Eplan eVIEW is only the start. "Our aim is to grow Eplan ePULSE into a global engineering network and to continuously offer new functions for it that deliver high added value," explains Hauke Niehus, Head of Cloud Business at Eplan.

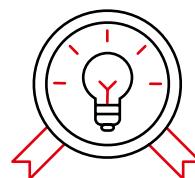
Further information about Eplan ePULSE is available at: [www.epulse.cloud](http://www.epulse.cloud)



Cloud technology

### Clever communication

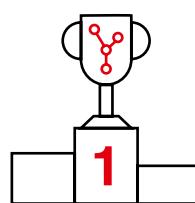
Syngineer optimises information flows and boosts productivity by 30 per cent. The cloud-based tool automatically creates sensor-actuator lists to improve communication and interdisciplinary cooperation during system development.



Awards

### Award-winning

The "Interface for Climate Control Solutions" from Rittal won silver in the "Industrial Network Technologies" category. Each year, Design News magazine presents the Golden Mousetrap Awards to innovative companies and products that are geared toward customer benefits.



Awards

### 1<sup>st</sup> place for Rittal

Readers of leading IT media put Rittal in first place in the "Datacenter Monitoring and Management" category for the extremely fail-safe RiZone DCIM platform. Rapid-deployment solutions from Rittal also won second place in the "Data center – ready to work" category.

**+++ New F-gas regulation: Use the Rittal F-gas calculator to check cooling systems. [www.rittal.com/f-gas](http://www.rittal.com/f-gas) +++**

# Strong together



**System technology.** What do American footballers and their focused team work to achieve the perfect play have in common with system technology from **Rittal** and **Eplan**? More than you might expect. In short, it's a case of one for all, and all for one. This metaphor highlights how a coordinated system that links together plant engineering and digital solutions can tap into undreamt-of potential.

Text: Jan Flegelskamp

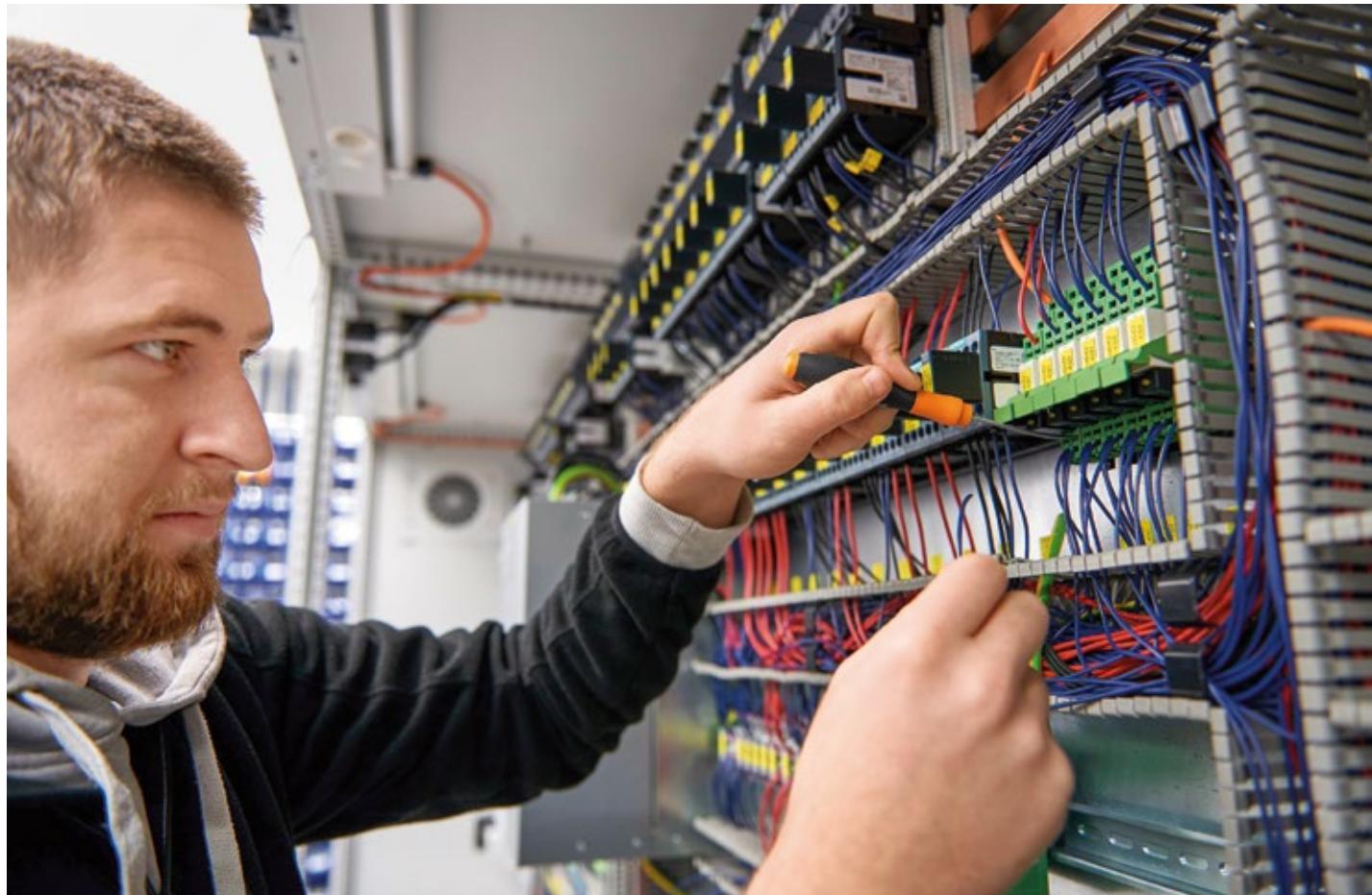


**A**merican Football. It's a heady mix of speed, precision and power, with individual players relentlessly pushing their performance to the limit and beyond – all for the good of the team. However, the action on the field is also backed up by digital solutions such as play call plans on a tablet and live-data analysis. This combination of athleticism and tactics has been proven time and again to pay off – in the successes of the system coaches and the enthusiasm of the fans. The interplay between enclosure system technology and software works in much the same way at Rittal and Eplan. When companies are planning and implementing systems in line with their requirements, they always have to bear in mind the documentation, the potential need for modifications in the future and, last but not least, the importance of cost-efficiency. Rittal and Eplan are continuously developing their system portfolio and combining value-enhancing process steps in engineering, design, work preparation and production to create a seamless value chain.

When it comes to efficiency, it's therefore always important to keep on scrutinising long-standing processes. At present, the major innovations in this area come from solutions that explore a new depth of integration. One specific example is wiring. At around 50 per cent, wiring accounts for the largest proportion of the total outlay that goes into building an enclosure. The conventional approach is to prepare the wire in advance, a process that involves cutting the wire to length, crimping it and labelling it, which takes 157 seconds on average.

#### THINKING AHEAD SPEEDS THINGS UP

The job can be speeded up considerably if the necessary connections can be factored into the planning stage, the ideal routes identified and the required wire lengths also calculated. The physical execution of everything that has been thought through while the electronics were being designed – the functionally defined electrical connections – can be planned in Eplan Pro Panel. "By linking together engineering and production, companies can create perfectly coordinated combinations of software solutions, system technology, machinery and services," says Thomas Weichsel, Head of Product Management at Eplan. The added value is clear to see – end-to-end solutions also give businesses the opportunity to boost productivity ►



**DIGITAL SUPPORT** Valuable time can be saved during wiring work if electricians make the most of digital assistants such as Eplan Smart Wiring. These handy helpers guide staff step by step through the set process to minimise mistakes.



and efficiency across all aspects of the product creation process and beyond.

Four-and-a-half minutes is how long an electrician needs to replicate an electrical connection shown on a circuit diagram in actual components in an enclosure. A third of that time is spent on preparatory work such as reading the wiring schematic and locating the source and target. Another 13 per cent of that time goes on preparing the wire itself – working out roughly the right route and length. The remaining 56 per cent of the time is taken up by the wiring work proper – cutting the wire to length, fitting the cable terminal end,

crimping it and installing it. "More often than not during the wiring process, electricians will flick through the entire wiring schematic several times over to piece together the information they need and flesh it out where necessary," Weichsel points out. About a third of the total working time is thus lost on reading and accurately interpreting the documents. The Eplan Smart Wiring assistance system is designed to simplify wiring. The software uses the digital prototype to provide wiring technicians with all the information they need. It clearly visualises the wiring process step by step – even on mobile devices, if required. "This leads wiring technicians systematically through their list of tasks," Weichsel explains, which clearly makes the otherwise very complex process of wiring much more straightforward: "If you can read, you can wire – there's no need for classic circuit diagrams anymore," declares Weichsel.

Most users still consider the classic wiring plan pocket to be the go-to repository for all the information and documentation needed for service and maintenance work, such as equipment lists, parts lists, terminal diagrams and, of course, a print-out of the circuit diagram. You could say they are like the play call sheets that quarterbacks consult during a football game. However, that's set to change in the future. A central information management tool is destined to help end-users and machinery and plant operators access system documentation digitally. This digital wiring plan folder could allow users with the necessary access rights to view all relevant documents. The advantages are clear – documentation is securely and centrally administered, available at all times and always up to date.

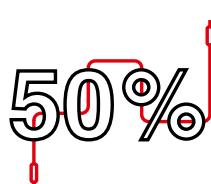


*"In the future, companies will have to thoroughly organise engineering, work preparation and production."*

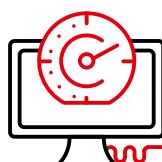
**Thomas Weichsel**

Head of Product Management at **Eplan**

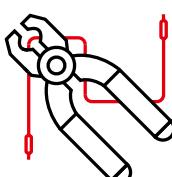
### Faster wiring



In a conventional set-up, wiring takes up half of the entire time that goes into manufacturing an enclosure.



However, this crucial step can be significantly speeded up by planning the wiring in advance on a computer using Eplan Pro Panel.



Every wire has to be properly prepared, i.e. cut to length, crimped and labelled.

**8X=**

Now the fully automatic Wire Terminal WT wire processing system from Rittal can take care of the task eight times faster.

### CLEARLY IDENTIFIED ON A DIGITAL BASIS

The digital documentation is linked to the enclosure by a unique, patented component QR code, meaning that every Rittal VX25 large enclosure, its components and accessories carry precisely such a unique labelling system when they leave the plant. This ensures every enclosure in the world can be clearly identified. An app from Rittal can be used to scan the QR code for accessing information on enclosure items or using Rittal Digital Information Management to view the Eplan project for the enclosure or machine. What's more, even redlining scenarios in service and maintenance can be mapped out by linking up to Eplan eVIEW, the new cloud solution from Eplan.

Only fully comprehensive solutions for optimising processes in enclosure building help users make real progress. That means combined hardware and software solutions, product-related data and holistic services for process integration throughout the customer's operations. If all the solutions really come together, the end result is perfection – whether in enclosure building or on the football field. Ultimately, the play works when the whole team pulls together, combines everyone's strengths and puts the best people in exactly the right positions. ■

# Networked with the world

**Manufacturing 4.0.** The new plant in Haiger represents **Rittal's** biggest investment in its history. It manufactures enclosures that are attuned to all the requirements that come with digital transformation – the new AX/KX series. The highly automated plant itself is also firmly embedded in the entire digital value chain. Here's a first glimpse into the inner workings of the new production facility.

Text: Jan Flegelskamp

Virtually silently, the vehicle rolls through the workshop, with not a driver in sight, or even any kind of remote control. It knows what it has to do and steers itself. Atop the flat transporter sits a pallet of preassembled and wrapped components for a compact enclosure – the new AX. The driverless workhorse carries its load to a roller conveyor leading into the warehouse. Workers repeatedly cross its path and can't resist gazing at the sight – after all, this is new territory for everyone. The Rittal plant in Haiger was planned from the ground up on a greenfield site. Completed within just under two-and-a-half years, it is packed full of cutting-edge technology and linked up to the massive ▶





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**SELF-DRIVING**

Automated guided vehicles roam the aisles of the new Rittal plant in Haiger. Red lasers mounted on the front help them find their way through the plant using a series of fixed reflector points.

If a person or some other obstacle gets in the way, the robots automatically apply their brakes and sound an alarm. "The robot's telling someone off," joke the staff at the plant.

**IMPRESSIVE**

The new highly automated plant in Haiger ensures “the new original” is delivered quickly and is continuously available (24 hrs in Germany; Europe will see a step-by-step roll-out of a 24-hour delivery service).

Rittal data network. Spring 2019 is ramp-up time for the world's most advanced plant for compact enclosures. “We're getting the machines up to speed just now – networking, coordinating and fine-tuning them,” explains Plant Director Oliver Poth, who has helped to shape the entire construction process. Through the window of his office, he looks out at the completed production line, which churns out 9,000 enclosures a day at full capacity. His eyes brim with delight as he reports just how much data the machines share with one another behind the scenes. “This is Industry 4.0 in action,” Poth declares, visibly proud.

**A SIGN OF CONFIDENCE IN GERMANY**

The laying of the foundation stone on 19 August 2016 set the wheels in motion for implementing this ambitious project. Construction work was still underway when the biggest system was integrated – the paint shop, through which every enclosure must pass. This is where they get their robust outer skin, whether in standard grey 70/35 or another colour of choice. More sections were added in April 2018 – logistics and machines. With the build now completed, the 24,000-square-metre site is home to more than 100 high-tech machines and plant components. The production area is split over two levels and the plant also has a 1,000-square-metre staff area complete with showers and changing facilities, affectionately known as “the rucksack”. Just under 1,000 staff members in total work at the Haiger site – on the production line, in the warehouse, at the logistics centre and in the administration wing. The people are one of the reasons Rittal has made the biggest investment in its history in Haiger – pouring more than 250 million euros into the new production site and the adjacent

logistics centre. Rittal's decision to build its plant here is a strong vote of confidence in Germany – and indeed the local region of Central Hessen – as a place to do business. Carsten Röttchen, Managing Director International Production at the company, is clear that the outstanding skills and qualifications of the local workforce were a decisive factor. Over the past two years, Rittal has trained 55 members of staff as plant operators here. Even a highly automated plant can't run without people. “We operate three shifts when at full capacity,” Plant Director Poth points out. People and machines work hand in hand here to manufacture a new generation of compact enclosures – the AX and the KX. The AX is set to replace the AE, the classic Rittal enclosure, more than 35 million of which have been installed since 1961 on everything from ski-lift stations to container ships. It's no wonder the manufacturer is already talking about the “neuen Original”.

“We have built this plant to make sure our customers across Europe can get their compact enclosures within 24 hours,” explains Röttchen. “Our thought process starts and ends with the customer – this plant improves the logistics of everything, from configuration and ordering through to delivery.”

Modern switchgear manufacturers don't use compact enclosures the same way they did even ten years ago, let alone 50, when the first AE rolled off the production line. Today, digitalization is the dominant force shaping the environments where enclosures are used and thus switchgear production ►

**ROBUST**

The automated guided vehicles criss-crossing the plant come in a range of sizes for carrying various loads from A to B. Transport system number 33 is one of the biggest models and carries stacks of blanks.



## New compact series

A new chapter in the success story of compact enclosures from Rittal is being written in Haiger – thanks to new functions within tried-and-tested systems solutions. The plant has been planned around the AX and its little brother, the KX small enclosure. By switching the compact series to the AX and KX, Rittal is opening up new perspectives for its partners with seamlessly digitalized processes within a tried-and-tested system. By introducing its AX and KX ranges, Rittal has redesigned and relaunched its entire offering of compact and small enclosures. Below, we take a look at the innovative features and the original, the AE.



### **Simple**

Anyone who wants to configure a new AX or KX can access high-quality 3D data easily through the Rittal website or via the Eplan Data Portal. The Rittal Configuration System and online shop are used to carry out the configuration and place an order. The smaller number of parts simplifies engineering processes. In addition, a QR code on all panels for machining supports seamless monitoring.

### **Fast**

Ordering and assembly are now even faster. The new highly automated plant in Haiger, Rittal can deliver products quickly and ensures continuous availability (within 24 hours in Germany; with a step-by-step roll-out in Europe, as well). All panels are supplied loose and can be immediately machined without having to be dismantled. The AX and KX can also be assembled very quickly because the whole process is virtually tool-free.

### **Flexible**

Compact enclosures are known for their versatility. Their new functions, such as modular designs and optimised cut-outs and sizes, help to better utilise the space inside the enclosure. The assembly process is not only fast, but also flexible. Reducing the number of parts also simplifies logistics and warehousing.

### **Safe**

Rittal is once again one step ahead with the new compact series, taking a proactive approach to safety and providing a future-proof solution. The AX and KX offer enhanced safety and security thanks to their protection classes and approvals. Using wall-mounting brackets to fix the products in place does not affect the protection category.



### **The first and original steps aside for its successors**

Rittal made industry history with the AE. Production of this first ever standard enclosure began in 1961, and the product has continued to evolve ever since. Its flexibility, combined with top quality, makes 'the original' the best-seller that it is – 35 million of them are currently in use worldwide. It is the forerunner to today's AX series and has certainly passed on its 'good genes'.



*"The production system in Haiger means better availability for our customers."*

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**Carsten Röttchen**

Managing Director International Production at **Rittal**

itself. More electronics call for more cables and wires for networking. "We are expanding the system with the AX, with fewer different parts and more installation space boosting flexibility," Mr. Röttchen explains. The improvements made to the product slot neatly into the digital supply chain. Customers can access high-quality 3D data via the Eplan Data Portal as early as the configuration and ordering stage to help create their AX or KX in the Rittal Configuration System. The product's digital twin takes shape during this process, giving enclosure manufacturers a useful reference resource for their machining systems further down the line. This digital twin is also referenced in the unique serial number that, along with all other details, is easy to match up to the enclosure thanks to engineering and the QR code. Orders are placed in the Rittal online shop, with the data for the series models immediately forwarded directly and automatically to the Global Distribution Centre (GDC), which is also fully automated. Customers can compare the availability of products while they are placing the order. "Since the plant is linked up to the entire data flow between the customer, sales, production and delivery, it becomes part of the digital order and delivery process," Röttchen points out. "That means better availability for our customers." The machines at the plant are also networked together themselves and are continuously sharing data. While this is es-



**INNOVATIVE** Rittal now uses laser welding to create the final geometry from the folded enclosures. This ensures the welding process is fast and leaves a slim weld seam, thereby delivering both enhanced efficiency and maximum quality.



**MONITORED** Plant operators at this welding workstation 4.0 oversee and direct the work of the welding robot via a large screen that displays the welding process in detail. This approach is even safer for staff.



*“This is  
Industry 4.0  
in action –  
networking all  
the machinery.”*

**Oliver Poth**

Head of the Haiger plant at **Rittal**

sential for current production processes, it also means that artificial intelligence can be used in the future to compare data against templates in real time and anticipate problems before they happen. Hence it isn't just the products that are new – the production technology itself is also state of the art. Take, for example, the machinery used to process the huge coils that form the basis of each enclosure – it is a composite system comprising a laser cutter and various stamping and stacking processes that work in parallel to manufacture the preliminary product. This speeds up response times. “Thanks to the latest production technology, we are much more flexible and can respond much faster to customer requirements. This futureproofs the plant long-term and ensures the products it manufactures are of a high quality standard,” Röttchen adds.

The automated guided vehicle has now offloaded the workpieces it was carrying and the package is rolling down the conveyor between the various machines, headed for the high-bay warehouse. The transporter, meanwhile, is already on its way to the next job. ■



Learn more about the Haiger plant in our picture gallery:  
[www.bit.ly/betop-haiger-en](http://www.bit.ly/betop-haiger-en)

## The plant in figures

**9,000**

enclosures leave the plant each day when it is running at full capacity. They are sent either to the adjacent high-bay warehouse or out on delivery.

**100**

high-tech machines and plant components were brought into the plant and networked with one another over the course of the process.

**24,000**

square metres is the size of the production area at the new facility. It covers two levels and has an employees' annex.

**1,000**

members of staff work at the Rittal site in Haiger, either in the plant itself, the administration department or the Global Distribution Center.

**250**

million euros is the sum the company invested in developing and building the new plant and adjoining logistics centre – the biggest investment in the history of Rittal.

# CONTROLLED



## Engineering.

Whether machine learning, chatbots or automated guided vehicles, artificial intelligence (AI) is breaking all the records in a whole range of fields. The Budarhals hydropower plant in Iceland is a perfect example of how AI can also generate added value for companies in the mechanical engineering sector.

Text: Sonja Koesling

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# POWER

**C**aptivating waterfalls, steaming-hot geysers and mesmerising northern lights – Iceland is an island of spectacular natural wonders. However, there is more to marvel at than the impressive landscape. Situated in the midst of endless expanses between the Þjórsá and Tungnaá rivers is the Budarhals hydropower plant, a pilot project run by Voith and local company Landsvirkjun that uses artificial intelligence. Thanks to its acoustic monitoring system, the plant can identify anomalies in turbine noises and thus prevent downtime before problems escalate. That is a particularly important task, given that Iceland's hydropower plants generate some 73 percent of the country's total electricity supply. The intelligent noise analysis system concealed behind the concrete façade is another piece of evidence that AI has become part of day-to-day business operations.

Speaking about digitalization in traditional mechanical engineering at the 2018 Cideon Management Conference, Dr Christoph Oestreicher, Senior Manager Advanced Software Systems at Voith, pointed out that "when artificial intelligence is combined with domain knowledge, data can be used to generate special added value. This saves us time and money and provides new insights that we can use to make processes even better." The system in Budarhals uses algorithms that recognise changes in the normal noise of the turbines

as anomalies. "By continuously recording and evaluating data, we can also optimise the running of the plant," Oestreicher explains. This ensures maintenance work and upcoming repairs can be planned in a transparent and efficient manner.

#### AI MEETS INDUSTRY 4.0

"Artificial intelligence is now starting to come into contact with another trend in mechanical engineering – Industry 4.0," says Prof. Detlef Zühlke, Chairman of the Board of Technologie-Initiative SmartFactory KL e.V. and former head of the Innovative Factory Systems research department at the German Research Center for Artificial Intelligence (DFKI). Industry 4.0 is all about networking people, machines and products in an intelligent way. The ultimate aim of this networking is to enable businesses to optimise both individual, isolated production steps and entire value chains. Whether or not that can succeed depends largely on digital data processing.

"Artificial intelligence is not all that new," Zühlke explains. "However, unlike in the past, for the first time we now have high-performance computers that can cope with the huge volumes of data we're producing, analyse it and break it down into useful information." It is only this processing that adds value and thus makes AI technology appealing – both for the sector in general and, more specifically, when it comes to imple-

menting Industry 4.0. Consultants at Accenture have calculated that AI technologies can help deliver both efficiency gains and new growth. According to the study "The Changing Landscape of Disruptive Technologies" by KPMG International, 26 per cent of the decision-makers surveyed are confident that AI will boost efficiency and productivity. Some 16 per cent think the advantage lies in lower costs. Meanwhile, 10 per cent believe in faster innovation cycles and 9 per cent in accelerated market launches. Zühlke is optimistic: "AI technologies offer the mechanical engineering sector an opportunity to create new business models. If we were to combine augmented reality with artificial intelligence, we could get a red marker to guide us to the precise location of an error in an enclosure containing 20 devices. An AR headset could display a circuit diagram that shows the wearer where particular elements are located, what purpose they serve, and how they are assembled. AI technologies can assist technicians trying to resolve errors by providing localised and relevant information as appropriate to the situation at hand and the people involved."

#### Essay

## "Seizing digital opportunities"

"Artificial intelligence" (AI) is the somewhat sensational collective term used to describe various types of machine learning. It is one of the ten major trends in digitalization and potentially the farthest reaching. Indeed, while automation was first introduced to perform simple tasks, now even demanding office jobs are at risk of being supplanted. But is that really a bad thing?

Actually, it isn't. Digital transformation means seizing digital opportunities so you can offer customers added value. There are advantages to that. For example, if knowledge databases and image processing systems deliver faster and better diagnoses than doctors, that doesn't mean doctors are suddenly surplus to requirements. What it does mean is that they finally have more time to spend with their patients. The same applies to lawyers, journalists, translators

and accountants – all these people can use AI as a tool to complete routine jobs quickly and efficiently. That frees up time for the more creative aspects of their work.

AI is also a weapon in the fight to reverse the shortage in skilled workers. Smart support can help people perform far more demanding tasks than they have in the past. That applies to everything from call centres to software houses and mechanical engineering firms.

What's more, AI is becoming increasingly easy to utilise, as it is integrated into programs we already use. Less routine work creates more space for ideas. When it comes to their own products, companies can also turn to a growing number of AI tools that dramatically increase the range of benefits, from data analysis to chatbots. That is good for customers and sales.



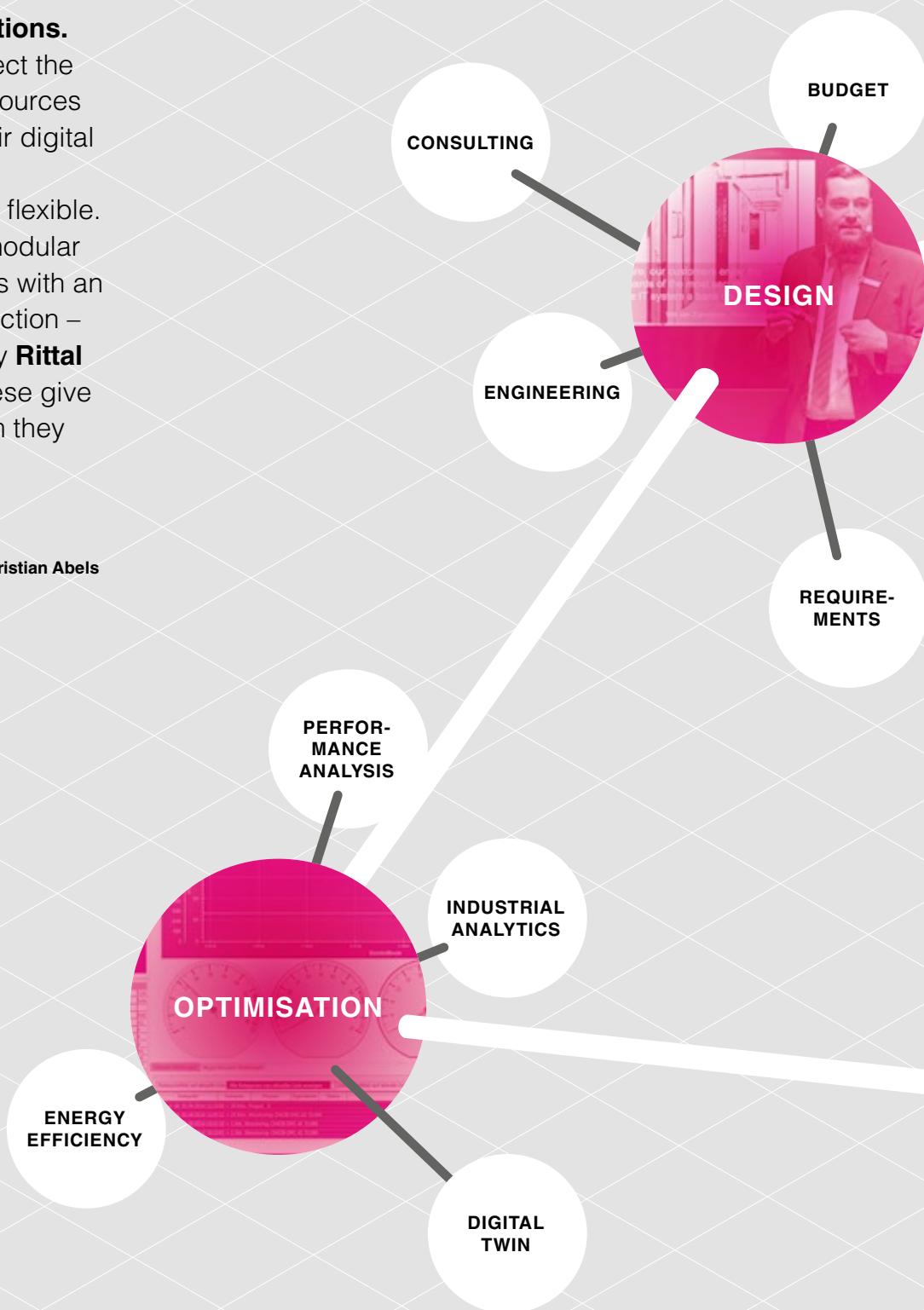
Keynote speaker and digital strategy consultant Ömer Atiker sees AI as a huge opportunity, believing that it offers added value, primarily when trying to combat the lack of specialist workers. He talks to be top about his views on the digital transformation.

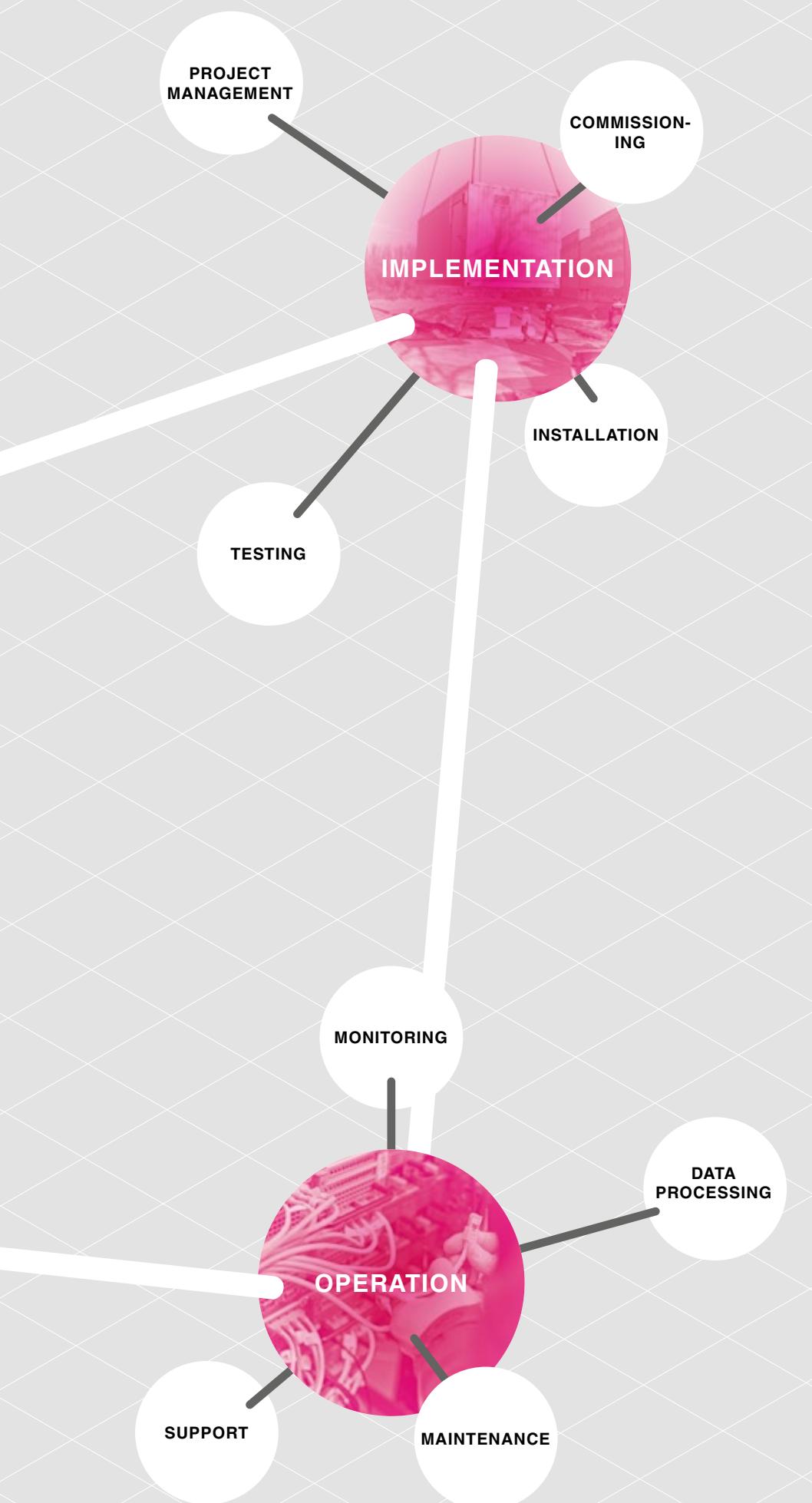
# Partners in value creation

## System-based IT solutions.

Today, companies expect the physical and virtual resources they use to operate their digital business models to be extremely scalable and flexible. The solution is to use modular data center ecosystems with an integrated cloud connection – like those developed by **Rittal** and **Innovo Cloud**. These give companies the freedom they need to adapt their IT landscape flexibly.

Text: Supriyo Bhattacharya and Christian Abels





**M**ost companies across all sectors have now recognised the opportunities that digital transformation brings and are rolling out digital strategies. They are either establishing new business models or developing existing ones further. However, one of the major challenges they face is finding the right partners to help them set up and implement a digital strategy. Faced with a staggering array of market offerings, most businesses are overwhelmed when trying to pick out the right digitalization concepts for their needs. A lot of these concepts often adopt a holistic approach when it comes to IT landscapes and make the mistake of setting out to create one-size-fits-all solutions.

In the modern business world, companies want and need to be faster at aligning their IT to new technologies or processes. If they are to respond promptly to market trends and get their outmoded legacy IT landscape onto a future-proof footing, they need two essential ingredients – modularity and scalability. These two elements ensure companies can build platforms one on top of the other, in a building block principle. Starting from physical components such as racks, a UPS and cooling systems and stretching as far as the application components provided in automated and standardised software solutions, modularity has to be a common theme throughout the IT landscape. Rittal and Innovo offer precisely that kind of structure – one that is also based on a holistic concept. Both companies are focused on ensuring customers enjoy fully comprehensive support and consistently prioritise standardisation, automation and modularisation as they renew IT systems.

#### THE CLOUD NEEDS POWERFUL DATA CENTERS

Renting instead of buying is completely normal in many areas of life, and that same approach is starting to take hold for company IT landscapes, too. Lots of businesses are turning to the cloud to make sure their IT systems can be adapted to new technologies or processes. According to the current Cloud Monitor of industry association Bitkom, more than two thirds of German businesses already use cloud services. The availability of the cloud and the prevalence of new technologies have established standards for the provision, costs and flexibility of IT infrastructure, and these are now also beginning to be applied to physical resources. Companies expect rapid, straightforward and needs-based access to infrastructure com- ►

ponents – in a service-style approach. At the same time, technological developments and increased security requirements are putting physical IT resources back in the spotlight. Part of that is ensuring data is available everywhere at all times and can be processed locally in real time. New data center solutions are based on a networked ecosystem with solutions from all layers: from the physical infrastructure located locally at the customer's site with optional connection to a central cloud to the fully comprehensive managed service operating concept. Physical and virtualised infrastructure components dovetail perfectly in these approaches. The effects that can be thus achieved in terms of the scalability and modularity of an IT landscape appeal to both companies that are just starting out on their digital journey and businesses with an advanced level of digitalization. The latter may, for instance, be looking to extend the level of automation in their digital business models.

The logical consequence of companies demanding modularity and agility from their state-of-the-art IT is that data centers themselves would also adopt a modular make-up. Indeed, data centers must be able to provide additional space quickly and securely. Normally, when it comes to building a conventional data center, the construction work can take at least one to two years. Standardised solutions, such as edge data centers, can be the right choice here: so-called empowered edges. Their advantage is that Rittal assembles the edge container according to the company's requirements and configures it. Innovo – together with this company – is designing the structure of the platform, which will be installed in the edge data center. This minimises the outlay at the user's end. These new data centers incorporate – in addition to the outer skin as in the case of containers – IT racks, power supply, climate control technology, servers, network technology, storage, cloud platform services and appropriate management software as preconfigured cloud components. Ideally, these can be chosen in line with the proposed deployment scenarios, and form the platform for additional cloud-based services (XaaS).

#### **REGIONAL PROXIMITY BRINGS SPEED**

Let's take 'click and collect' as an example – how many products are available in branches and can be reserved through an online shop? Companies pursuing digital business models need live data, and laten-

cy times within milliseconds are crucial for real-time analyses. To meet both these requirements, IT systems must process data very close to where it is generated. This is where 'edge computing' comes in. Innovo and Rittal have established Germany's first cloud park designed specifically to satisfy these needs at Industriepark Höchst in Frankfurt am Main. The containers from Rittal ensure the data centers can be scaled on a modular basis at short notice, while Innovo provides the necessary cloud infrastructure. Another advantage of the Höchst site is its security, which is underpinned by the German legal system on the one hand and the on-site security team on the other. Modular IT ecosystems have a decisive advantage because they are



*"The times of experimental thinking and planning games for digital transformation are in the past."*

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**Martin Kipping**  
Vice President Global Datacenter at  
**Rittal**



*“Rittal and Innovo stand by customers and, together, accompany them through their digitalization projects.”*

**Stefan Sickenberger**  
Chief Information Officer at  
**Innovo Cloud**

standardised from end to end and therefore considerably reduce time-to-market and costs. Service components ranging from simple server racks to entire containers and XaaS ensure companies can respond quickly to new requirements, taking out new components or scaling back their resources. This means businesses can create the infrastructure for new business models a lot faster, test innovations on the market sooner and then get them on sale. All the while, standardisation helps drive down the costs of individual IT solutions.

#### **SECURITY COMES FIRST**

Security can often be the all-important factor when choosing the right IT partner or

cloud provider. Financial service providers in particular need to meet stringent security standards and compliance requirements. Due to the standards of the German Federal Financial Supervisory Authority (known by its abbreviation BaFin), financial service providers need a partner who helps them monitor IT outsourcing. This includes a regular inspection of data centers with external auditors. Personalised Service Level Agreements (SLAs) play an important role here, as do third-party processing contracts, which are always involved according to the General Data Protection Regulation (GDPR) when personal data is processed by external service providers. Therefore, many companies are concerned that their data do not leave the place where they do business (in our case Germany). Picking the right provider isn't just a question of trust, it's a matter of whether the provider's IT security systems can be adapted to the needs and demands of the relevant industry and clientele. In fact, this provider is also responsible for building and integrating the infrastructure and connected service solutions and running them smoothly and securely. Fundamentally, companies working on data center ecosystems need to think carefully about how security can be ensured consistently across all components. Which relevant certifications, such as ISO 27001, does the supplier have? What experience do they possess in the sector? What security components are available?

#### **TIME TO LET GO OF LEGACY WASTE IN IT**

In terms of technology and the market, IT is constantly changing. The IT systems a company installs today can be superseded by a new generation of solutions in a matter of a few years, sometimes just months. Many businesses really struggle with their IT systems when trying to digitise processes and business models. In a recent study, specialist research company IDC established that around three quarters of companies find it difficult to implement their transformation strategies. The high outlay involved in integrating new digital solutions into existing systems is a particularly big cause of projects stalling. This is where Innovo is seeking to establish a strong position for itself. It assists companies as a reliable partner in the implementation of their digitalization strategies. The modularised platform approach practiced by Rittal and Innovo helps individual customers to upgrade their IT landscape step by step and keep it agile. ■

# Tailoring the process to the customer



## THE IMPROVEMENTS

are as clear as day for Frank Lörchner (left), Process Engineer Industrialisation at LKH, and Dieter Schneider, Process Engineer and SEUB Coordination at LKH.

**Technology and people.** Year after year, **LKH Kunststoffwerk** have notched up considerable growth. Over the past two years, processes have been tailored to reflect growing customer requirements and strategically developed to factor in future development.

Text: Meinolf Droege

**F**ollowing dynamic growth over recent years, LKH now wins around 100 new injection moulding technology projects each year. Thanks to extensive investment in plant technology, growing materials expertise, and a flourishing talent for engineering solutions to meet technical production requirements, the company has become an attractive supply partner for global customers across a range of sectors. However, the pace of growth and an increasing focus on the automotive, electrical engineering/electronic and packaging sectors have required a great deal of work on adapting internal processes. That meant focusing heavily on developing organisational aspects in 2017 and 2018. Managing Director Volker Hindermann explains: "The aim was, and still is, to guard against all types of disruption that could affect any aspect of the product creation process – from the customer's idea through to the logistics for the finished parts – and to achieve close to 100 per cent delivery reliability." LKH has made considerable progress in this regard and achieved significant improvements as a result. The most obvious steps included the certification of processes to IATF 16949 (the international standard for the automotive industry) and for the environmental, energy and health and safety management systems. Key customers have also given the company high scores in Run@Rate evaluations for series launches, which are often used in the automotive sector. Last, but not least, the rising values in the in-

house KPI reports are also pointing in the right direction.

#### DEPTH INSTEAD OF BREADTH

"Another contributing factor is that we are increasingly focussing on sectors where we can put our strengths to particularly good use – automotive and E&E. Added to that are special applications in packaging and factory equipment," Hindermann points out. However, this focussed approach will see the company explore its core segments in even greater depth – first and foremost its keen expertise in hybrid injection moulding with very low tolerances and production-optimised mould engineering. This has brought the entire, extensive simulation service – aspects of which used to be externally sourced – in house, even as far as setting up a dedicated "shrinkage database" for many materials. As a result, even complex components can be developed to series production with fewer revision loops. Detailed mould documentation also gives customers added peace of mind.

The company has also tapped into external expertise to align its processes more closely with those of major customers and introduce useful improvements – for example, augmenting the workforce with experienced workers from the automotive sector. "Ultimately, the industry needs better partners," Hindermann explains, "partners who truly understand their needs and can meet them." At LKH, that meant taking the decision to pool all the steps in a project into one pair of hands. The Head of Engineering, Thomas Ritter, is now responsible for all projects from the initial customer enquiry through to the start of series production. "That speeds up processes, minimises interfaces, improves communication and makes agreements more dependable. "As a result, delivery reliability for series ramp-ups rose to 92 per cent in 2018, and it looks set to carry on climbing in the first quarter of 2019," explains Ritter. In recent years, LKH has already invested massively in injection moulding technology and quality assurance. State-of-the-art machinery, including highly automated and integrated production cells, are running extremely efficiently. "When you look at all the hard work that's been done on our processes, you could say we've scored a hat-trick," Hindermann says, offering a neat metaphor. "We have specialists with the relevant expertise, we have optimised processes – which we will naturally continue to work on – and we have the technologies. However, in contrast to many other companies, we also have a



*"Delivery reliability for series ramp-ups rose to 92 per cent, and looks set to carry on climbing."*

**Thomas Ritter**

Head of Engineering at **LKH**



*"Industry needs partners that can meet its needs."*

**Volker Hindermann**  
Managing Director at **LKH**

fourth element up our sleeve that should not be underestimated. We have a very strong family company behind us that is not dependent on bank financing – the Loh Group. That also helps with the kind of short-term investments customer orders sometimes require." This speeds up large-scale projects that could involve a large number of moulds or large quantities, for example, and means that safety reserves can be built up for hardware, production facilities and automation systems. These, in turn, benefit process reliability.

The internal next-step program first staged in 2017 has helped LKH make considerable progress in completing complex customer projects. Intensive KPI assessments ensure problems are uncovered, and customer satisfaction is set to increase even further over the coming year, thanks to the dovetailing of staff expertise with the implementation, standardisation and upkeep of processes tailored to the relevant sector. "We want our components to help our customers get even better day by day," Hindermann declares, setting out his objective. That should provide a solid basis for further strong, sustainable and profitable growth at LKH. ■

# Smart power system

## Power distribution.

The Ri4Power system by **Rittal** based on the VX25 boasts numerous advantages, such as a 40 per cent higher current carrying capacity with the same bar cross-section, easier assembly and smart monitoring options.

Text: Sophie Bruns

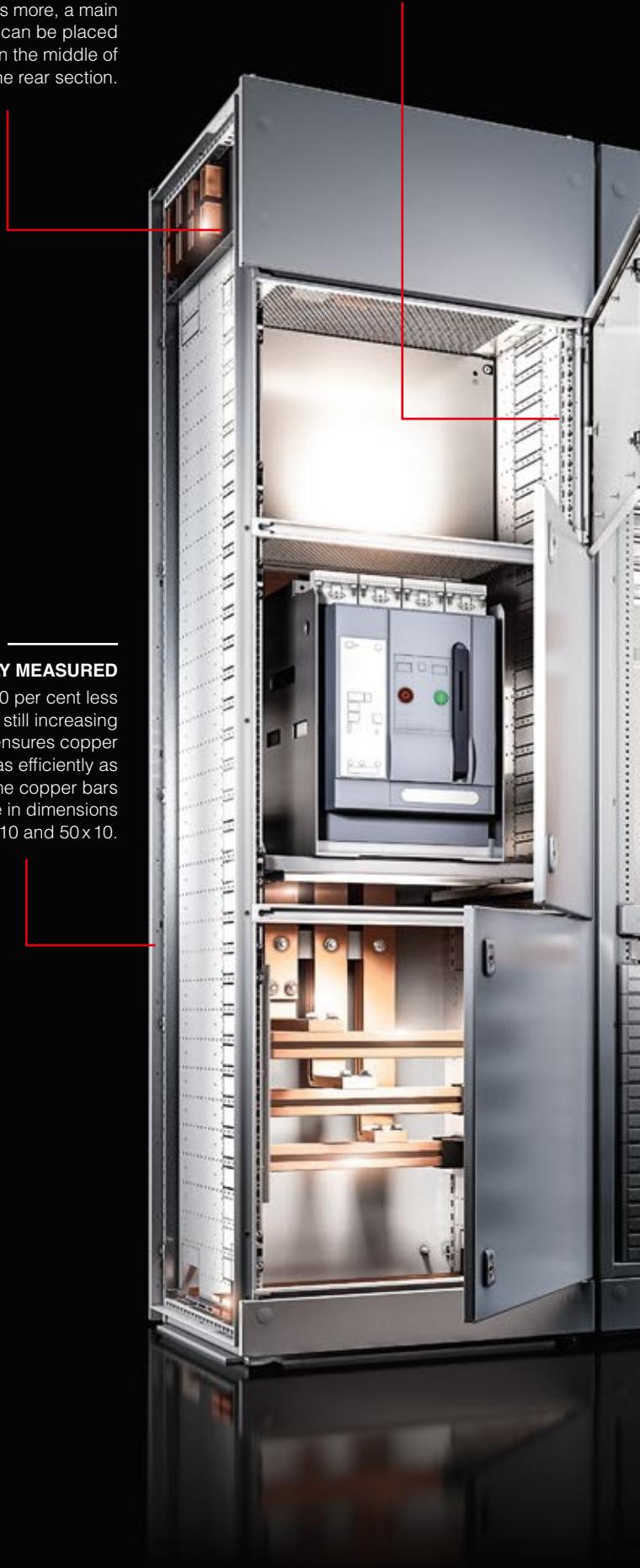
No matter whether it's in metalworking or textile production, machine and plant engineering is booming. At the same time, more and more increasingly powerful drive technology is also being used, which means electrical energy distribution switchgear need to up their game, too. A crucial requirement for switchgear is the ability to handle higher rated currents while taking up as little space as possible. The VX25 Ri4Power system offers the perfect solution, supporting rated currents of up to 6,300 A despite the minimised cross-section of its copper bars. "In spite of the higher current intensity, no extra room is needed – quite the opposite, in fact. We have the same functionality but with 20 per cent fewer articles," explains Jörg Kreiling, Head of Product Management for Power Distribution at Rittal. "The less copper we install, the more we can reduce costs, since copper is an expensive material," says Kreiling, pointing out the benefits. Moreover, the systems undergo design verification in line with all relevant standards. ■

### SIMPLIFIED

A one-piece busbar support is now attached directly to the frame using just two or three screws. What's more, a main busbar system can be placed in the roof or in the middle of the rear section.

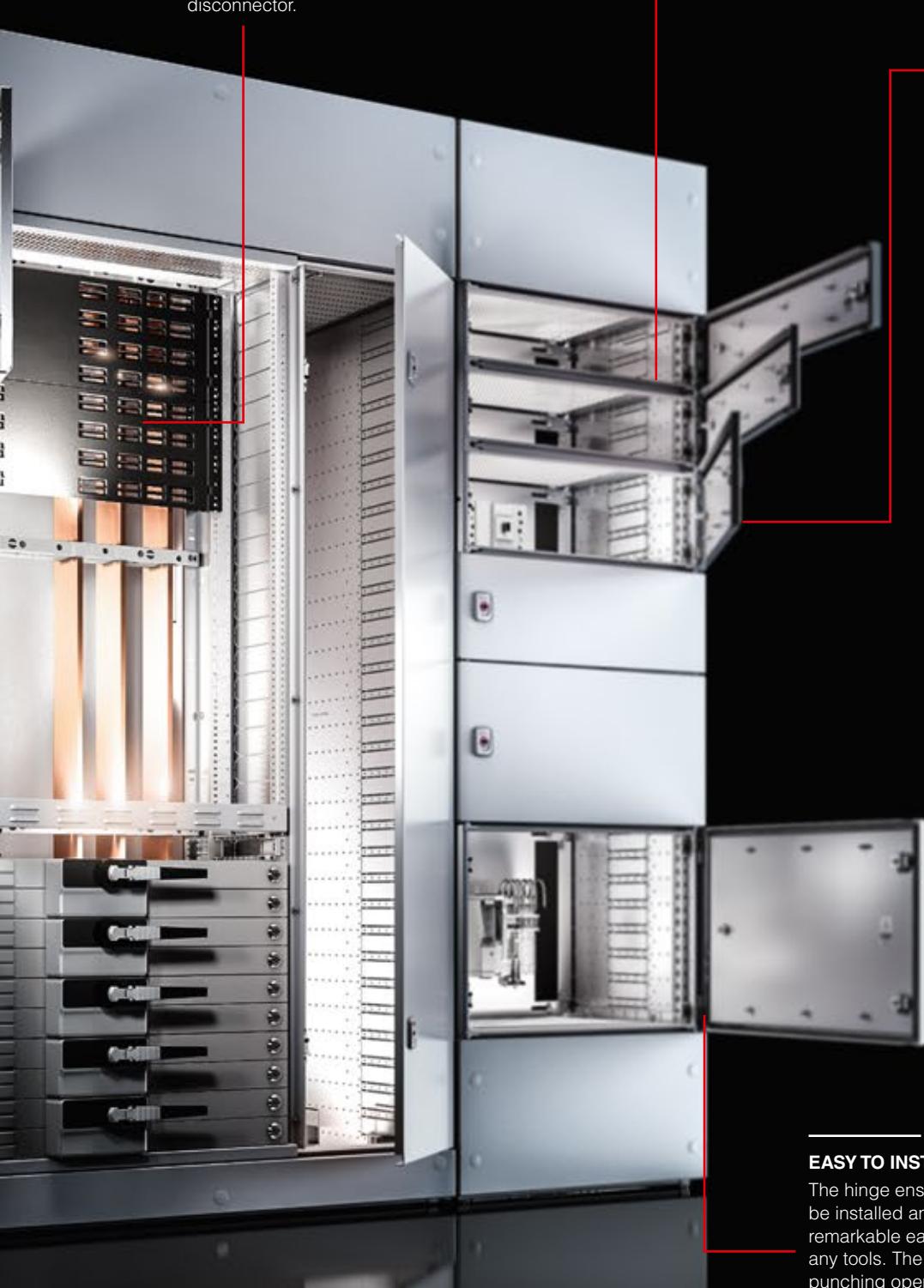
### METICULOUSLY PLANNED

A functional space divider ensures enhanced heat dissipation and ideal pressure equalisation. Things have been simplified here, too, as there is now only one side panel for left and right.



### PRECISELY MEASURED

Using 40 per cent less copper but still increasing performance ensures copper is used as efficiently as possible. The copper bars are available in dimensions of 30x10 and 50x10.

**WELL MAINTAINED**

Depending on their requirements, customers can use various components to divide up the enclosure in a custom arrangement. There is one field type for all horizontal types of slimline switch-disconnector.

**CLEVER SCREW FIXINGS**

Assembly is just as straightforward, with the sophisticated partial door concept making it possible to achieve a variety of Form separations.

**PRACTICAL PARTITIONING**

The functional space divider is used in much the same way as a shelf in a wardrobe and is mounted into the assembled enclosure. Rails and cables can be inserted at the side.

### An intelligent switchgear system

The VX25 Ri4Power system simplifies intelligent processes – from assembly and engineering right through to maintenance work. When it is combined with the new version of Power Engineering planning software from Rittal, customers can plan switchgear in next to no time. A further benefit is that users have very few parameters to specify and can therefore configure type-tested switchgear. Besides being extremely intuitive to use, the system can also be linked to Eplan Electric P8, Microsoft Excel and import/export interfaces for data maintenance. VX25 Ri4Power enables users to monitor their switchgear in operation via an IoT interface, which can be connected to various sensors that monitor temperature and humidity or measure voltage, current and power, for example. The data collected can be transferred via an Ethernet network connection to a higher-level control system and visualised. Since the data can also be evaluated in the cloud, users can easily conduct analyses for the purpose of optimisation.



Configure your designs now with Rittal Power Engineering at: [www.ittal.com/configurators](http://www.ittal.com/configurators)

**EASY TO INSTALL**

The hinge ensures doors can be installed and removed with remarkable ease and without any tools. The square punching opens up more assembly options across all profile levels.

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# A strategy for the east



**Steel market.** Slitted coils and pressed parts are needed all over Europe – not just in Germany. Among the fastest growing markets in the EU this year are the Polish and Czech economies, which are each likely to expand by more than 3 per cent. Poland has even overtaken Turkey to seize the title of biggest European manufacturer of household appliances, or white goods. The Czech Republic, which has a strong tradition as an industrial location, is also a major buyer of industrial goods. The biggest export partner by far for both countries is Germany

Text: Markus Huneke

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**W**ith a major traffic interchange right on its doorstep, the Stahlo site in Gera – right on the A9 and A4 in the eastern part of Thuringia – is pretty much ideally situated from a logistics perspective, as is the nearby Nordhausen site. All in all, it is an excellent arrangement for reaching customers not just in Bavaria and east Germany, but also in the two neighbouring markets a little further to the east. Added to that, both Poland and the Czech Republic are important centres for automobile production, and thus a rich source of potential customers for pressed parts and slotted coils made from high-strength and ultra-high-strength steel and aluminium. Indeed, international carmakers have to follow the same standards no matter where they operate, so Stahlo can present itself as a strong partner and valuable supplier. After all, it has the necessary experience and technological expertise, as evidenced by its IATF 16949 automotive certification. Its product portfolio, know-how and range of services place Stahlo Stahlservice in a perfect position to serve these markets – a status it has earned step by step by continuously investing in equipment, processes and staff. The latest example of this forward-looking approach is the ultra-modern, networked production site in Gera, which is now in its final stage of construction. The new plant can handle ultra-high-strength steels of up to 1,900 MPa in the outstanding quality required for automotive outer body panels and process aluminium slotted coils and contoured blanks. Not only does the new plant boast state-of-the-art technology, it has also significantly increased production capacity, primarily for the pressed parts required in the automotive industry. Proximity, availability and expertise – it's an appealing combination for customers.

#### START OF PRODUCTION IN GERA

The new-build at the Gera plant is as good as complete. There have been slight deviations from the ambitious schedule the company set itself but, after all, this is a completely new production site that is breaking a lot of new ground in terms of networking. "We are establishing a cutting-edge steel service centre in Gera, kitted out with state-of-the-art facilities. That presents numerous challenges. We spoke to customers, suppliers and machine manufacturers to discuss requirements and share experience. This all helps to make the site efficient and push up performance," explains Guido Spenrath, Managing Director of Stahlo Stahlservice. The production facilities – two slitting lines



*"We are establishing a cutting-edge steel service centre in Gera, kitted out with state-of-the-art facilities."*

**Guido Spenrath**  
Managing Director at **Stahlo**



and two blank cutting lines – were installed in the new plant in March. The new slitting line became fully available at the end of the month. The pre-existing system is currently being upgraded and set up again at the new site. Both are scheduled to reach full capacity by May. The new contour cutting system is also in the process of being assembled and is scheduled to achieve its full performance range at around the same time. After that – in the same way as the slitting technology – the pre-existing system will be upgraded and reinstalled at the new site. Staggering the installation of the various machine systems this way avoids compromising production capacities. "In addition to steel, we will also be processing aluminium on our production lines in the future. We have our first orders booked in for the end of the year and are manufacturing aluminium parts for a German sportscar manufacturer," Spenrath reveals.

Despite all the high-tech solutions, Stahlo still hasn't forgotten about its 'bread-and-butter business'. In a move designed to expand its capacities and processing options as a supplier of cut-to-size sheets, the company just recently took over Blechservice Nordhausen, which is also based in Thuringia. This has further increased its availability and delivery capacities for customers.

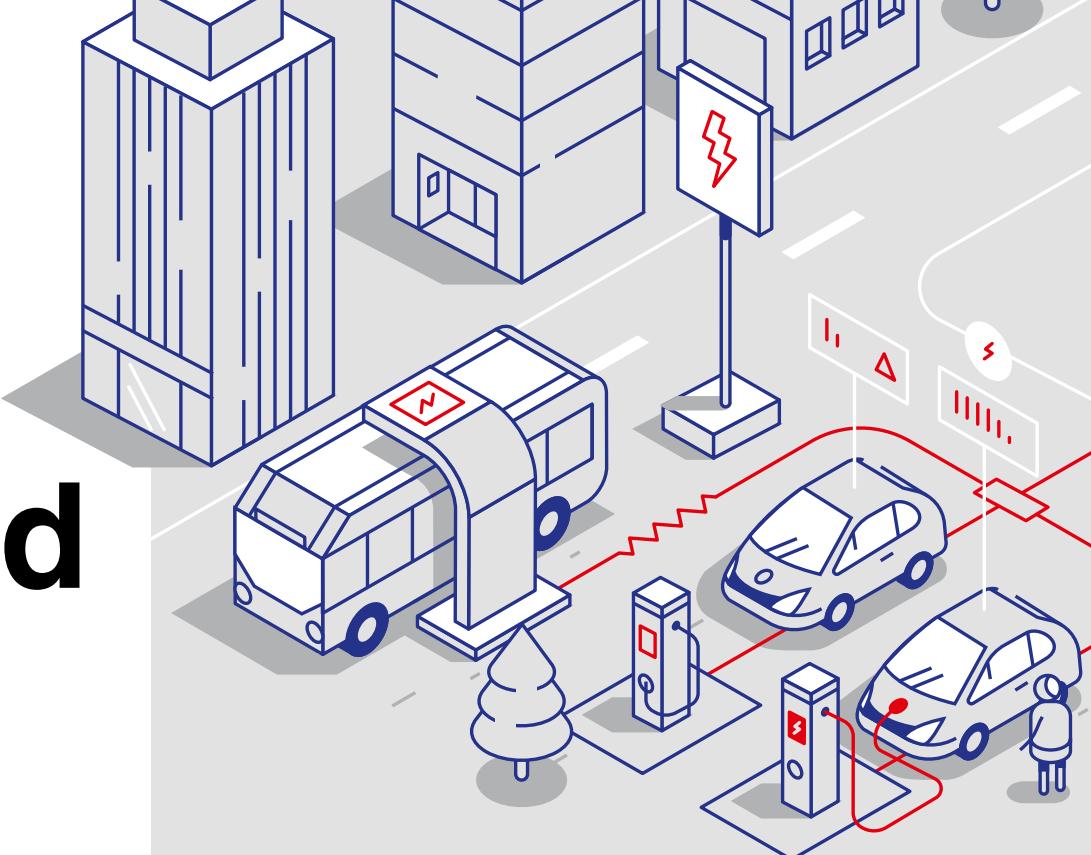
Stahlo is not an entirely unknown entity on the markets to the east. The company is already active in the Czech Republic as a supplier for the automobile industry and in Poland as a supplier of slotted coils, albeit on a more modest scale. Through these activities, Stahlo has established an excellent reputation as a reliable and flexible supplier of processed steel products. Plans are being made to significantly expand this line of business, with Stahlo aiming to generate 10 to 15 per cent of its sales there in the medium to long term. "Our biggest challenge is to establish and grow the Stahlo brand in Poland and the Czech Republic," Spenrath explains. The steel service centre certainly faces some tough competition. However, the name that Stahlo has already made for itself in the international automotive sector as a supplier to German sites is an advantage that should not be underestimated. After all, a personal recommendation from a decision-maker in the right place is worth more than any marketing campaign. "So far, we've always done a good job and consistently developed our status as a reliable partner in the automotive industry," says Spenrath. That approach could now pay off in Poland and the Czech Republic, too.

# Fully charged

## Enclosure technology.

Electromobility is becoming increasingly appealing, not least because the charging infrastructure is getting better and better. **Rittal** supports the entire value chain, from power generation through to the charging station.

**Text:** Sophie Bruns

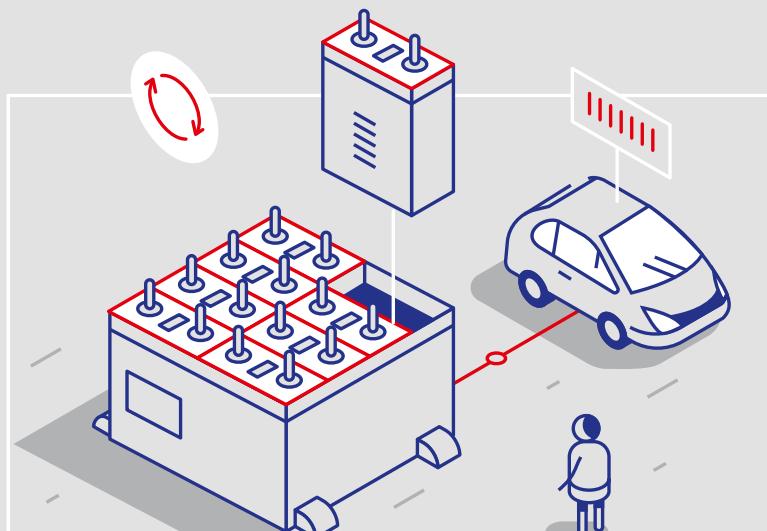


## Optimum performance for chargers

Electric cars can top up their power at chargers in a similar way to refuelling at a petrol station. The car is simply parked at the charger. Rittal offers enclosure solutions for these chargers in the shape of either standard enclosures for industrial applications or bespoke designs. Twin-walled enclosures are particularly suitable as they satisfy the impact resistance requirements for public fast chargers and can be configured with a particularly resilient design.

**W**hen Michaela Schneider gets home from work, she already has the next item on her to-do list lined up – shopping for the weekend. She has just under half an hour before she has to pick up the kids from school. When she arrives at the Hessen-Center mall in Frankfurt, she steps out of her electric car in the car park, plugs it into a 50 kilowatt charger, checks her shopping list and heads for the store. In the half hour Michaela is busy stocking up on her store cupboard essentials, her car is topping up its power reserves ready for the next 100 kilometres.

"We've made it our mission to take e-mobility from a niche to the mainstream," explains Thorsten Nicklass, CEO of Elli (Electric Life), a subsidiary recently established by Volksbank. What this means is that a growing number of users like Michaela will, in future, be able to charge their car where they work, shop and live. "Electromobility calls for a different approach to fuelling our cars, making it part of our daily routine," Johannes Gimbel, Vertical Market Manager Automotive at Rittal, explains. The automobile industry has also been working hard on this, not least since ▶



## A second life for car batteries

If the power density of a battery starts to give out to the extent that the electric vehicle can no longer rely on an adequate power supply, the battery can instead be used as an alternative power supply for a charging station, for instance. Depending on the relevant scenario, these batteries are housed in either an indoor or outdoor enclosure. The climate control concept is designed in line with the C-rate, which plays a big part in determining the waste heat generated by the batteries. The C-rate is a battery's nominal capacity in ampere-hours in relation to the charge or discharge current.

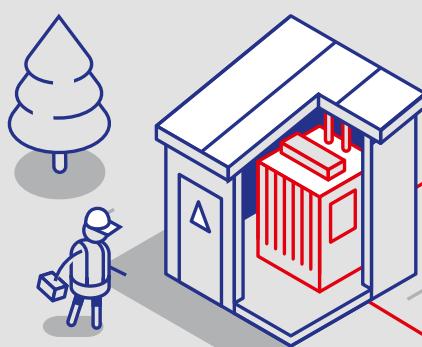


### **Electronics under one roof**

The power electronics and control modules provide the supply for several chargers and therefore need to be well protected. Various climate-control concepts and structures can be implemented in one secure housing by using divider panels, 19" mounting frames and mounting plates.

### **Power saved**

One container for all. To establish a complete energy storage infrastructure, Rittal offers preassembled containers for everything from racks and battery mounts to the necessary climate-control systems. One such solution is the VX25, which supports rapid battery replacement and can accommodate high loads of up to 1,400 kilograms.



### **Transformers in containers**

The transformer station is where the current from the medium-voltage network is converted into the electric voltage used by the low-voltage networks.

### **Powered by electricity from the start**

As renewable energy sources, the sun and wind have been growing in popularity for years. In addition to solar and wind power, electromobility can also be powered by coal and natural gas. Rittal supplies turnkey system solutions and control cabinets for wind farms and generator terminal boxes for solar panels.



the diesel scandal, and since public authorities started banning cars from city centres and the European Union introduced stricter CO<sub>2</sub> limits for new cars. Even though electromobility using 100 per cent electricity from renewables is by far and away the most highly developed eco-friendly mobility solution for our roads, there is still the RIP problem – range, infrastructure, price. There has, however, for a number of years, been an additional solution for the infrastructure issue in Germany besides a proliferation of 50 kilowatt charging stations. Drivers making long journeys through the country can also use special fast chargers to top up their batteries at motorway service stations in the space of a few minutes. "The Rittal outdoor enclosure solutions satisfy the most stringent requirements and are helping introduce standardisation into the infrastructure. We've also raised our profile with customers as a result," Gimbel adds. One of the first customers to approach Rittal about electromobility was Enercon, which supplies charging stations and took the first 350-kilowatt fast charger into operation in 2018. "We needed reliable enclosure technology for our new E-Charger 600," Dr Frank Mayer, Project Manager for Rapid Charging Stations at Enercon, explains. "Since Rittal already had proven experience and expertise in enclosure design and in the energy sector, it was just the right fit for us."

#### WELL PROTECTED

"Rittal supports the entire value chain from power generation through to climate control for the charging stations. We can also make the most of our expertise in other sectors such as telecommunications. The very heart of the modular system at Rittal is always the stable frame," Gimbel points out. One particularly important quality factor when it comes to outdoor enclosures is secure access and personal safety. What's more, fluctuating weather conditions mean that cooling is needed for when things get hot and heat needs to be consistently distributed. However, it is not just wind and weather that affect the condition of a fast charger. "Enclosures that are out in the open need to be secured against break-ins and the power electronics must have an adequate climate control solution, too," Gimbel explains. The electricity cable on the latest generation of fast chargers even needs its own liquid cooling solution. However, as well as already having a suitable range of products, Rittal is also working on more concepts. "We are keen to collabor-



**NICE AND GREEN** Quick chargers by Enercon are powered by renewable energy. The wind turbine manufacturer relies on enclosure solutions from Rittal.

rate with our customer on expanding the use of second-life batteries and supplying the corresponding enclosure solutions. The potential of old car batteries can be used for an alternative power supply," says Gimbel. Expanding supply stations like these could be another solution to the RIP problem – and another opportunity for users like Michaela to top up their battery wherever they are. ■



Find out more about electric cars in the online version of be top at: [www.bit.ly/betop-emobility-en](http://www.bit.ly/betop-emobility-en)

# “E-mobility for all”

**Fast chargers.** Finding an **Ionity** charging station is not much of a problem for electric vehicle owners these days. Europe's biggest fast charging network uses chargers from Australian supplier **Tritium** – including integrated technology from **Rittal**. Tritium's founder and CEO David Finn explains why now is the time to have faith in e-mobility.

Interview: Sophie Bruns

**Mr Finn, Tritium has been operating for 20 years now. What motivated you to set out on your own?** I never actually intended to – it just happened. At the time, I was at the University of Queensland, where we were using batteries to run power electronics systems and applications. After a while, we discovered the potential of fast chargers and started to develop our expertise in this area.

**That saw Tritium become one of Australia's fastest growing companies....** ...going from a start-up to being one of the five biggest suppliers in the e-mobility market was an exciting journey for us. We've received financial support from the Government of Queensland over the past two years so that we can continue to grow. In the beginning there weren't many electric cars in Australia and growth was sluggish. That was another reason why we expanded into Europe – things were moving faster there.

**One of the key concepts at Tritium is “energy freedom”. What exactly does that mean?** It has a dual meaning. Firstly, it's about being able to charge your car with electricity easily whenever you like – and at a low cost. Secondly, it also means people don't need to change their lifestyles to do something good for the environment. Electromobility is becoming accessible for a broad mass market. People can install these systems at their house, too, and achieve independence that way.

**Does this also make electromobility more appealing?** Most certainly. When there are more chargers, there's more trust in e-mobility. Besides the price of an electric or hybrid car, range also plays a crucial role. Once the vehicles can cover a long distance on a single charge and there are enough charging stations around, there's no longer any reason not to use electric vehicles. Our aim is to ensure everyone will in future be able to charge their car really easily, whether they're out and about, at work or at home.

**How is Rittal helping you pursue this aim?** When we launched production to meet an order for IONITY, we needed to find a supplier for enclosures. One of the key criteria was rapid availability, as we also had to fulfil this major order quickly. Other important factors were the service and availability offered by Rittal. That is what won us over.

**Not only have you expanded into Germany, but last year you were also declared “Queensland Exporter of the Year”. What do you have planned next for Tritium?** The new headquarters in Amsterdam is going to be an exciting project, but we basically want to keep heading in the same direction. We have grown year on year and expanded worldwide, and we can and should see the same trend continue as regards infrastructure. ■



**DAVID FINN**  
founded Tritium in Queensland, Australia. The company is expanding into Europe to meet the needs of IONITY, one of Europe's biggest charging networks.

# Direct current for smart production

**TecFactory.** Industrial robots, powered by direct current supplied by solar modules mounted onto the roof of the production workshop. Not long ago, this might have sounded like science fiction, but it's already tried-and-tested science fact for researchers and engineers. **Daimler** now also wants to use this process in the new vehicle production plants it is constructing.

Text: Vera v. Keller



**I**t's an idea that puts a glint in the eye of technicians and engineers alike – instead of drawing alternating current from the grid, why not run all production systems and equipment on electricity supplied by an energy-saving, direct-current in-house network? This would be fed by on-site solar and wind power, with any surpluses, such as braking energy from robots, recovered and temporarily stored along with the short-term surpluses that renewables generate. Switching industrial production systems from alternating current to direct current offers companies clear benefits.

To start with, it boosts energy efficiency. Smart production operations based on direct current can put green energy from solar or wind power straight to use, incurring none of the losses that would otherwise come from converting the DC generated by renewables into the AC required by conventional consumers. What's more, running production operations directly on green electricity makes an important contribution to the energy revolution and therefore to climate protection, which is an international task. Not only that, but companies that generate their own power from renewables are

less exposed to current fluctuations in the public grid, which can potentially cause rejects during production.

The automotive industry – by far the biggest user of industrial robots – has grasped the opportunities that come with using direct current and is spearheading this process. The first step in developing energy-saving and energy-efficient automobile manufacturing came from researchers and engineers working on the European AREUS (Automation and Robotics for European Sustainable Manufacturing) project and its follow-up project DC-INDUSTRIE at Daim-



#### PIONEERING

Carmaker Daimler is developing and testing the production processes of the future at its TecFactory.

Besides new machinery, work at the site also focuses on the power supply systems for production plants. Rittal plays its part in enhancing the energy efficiency of the innovative plants with its Blue e+ cooling units – powered by direct current.

ler's TecFactory in Sindelfingen, Germany. Staff at this innovation and development centre for production technology are researching energy-saving production processes in a 'Smart DC Grid' and testing them out under realistic conditions. Involved in this work are a number of German universities, the Fraunhofer Institute and companies such as Daimler, Siemens and Bosch-Rexroth – Rittal is acting as a technology partner for various aspects.

AREUS experts developed the prototype for a completely new robot cell based on the premise that production would run

on an efficient direct current grid. Four robots work in a square measuring nine by nine metres – a complete production plant in miniature format. Rittal Blue e+ cooling units are being run on a DC voltage of up to 650 volts for the first time as part of this pilot plant. Their job is to provide the cooling output needed to ensure the production sequence runs smoothly. Steffen Wagner, Director Product Management Climate Control at Rittal, says: "We have developed the world's first cooling unit for these special needs. We're also using the patented hybrid process for the pilot plant." This means that the compressor is only used when passive cooling is no longer sufficient. That detail already helps Blue e+ units to be 75 per cent more efficient on average than conventional cooling technology. "Innovations and new technologies like those we have seen in the TecFactory also call for new, cutting-edge infrastructure solutions," points out Markus Schäfer, Member of the Divisional Board of Mercedes-Benz Cars, Production and Supply Chain Management.

#### AN ENVIRONMENT UNDER CONTROL

It won't just be robots and devices running on direct current that will come to the fore in efforts to boost energy efficiency by up to 20 per cent – automatic control and monitoring systems will also play an increasingly important role. The Rittal IoT interface, for instance, can be used to monitor ambient temperature and atmospheric humidity and to measure and analyse energy data. The power consumed in the TecFactory is generated by a photovoltaic system, and there are storage devices for temporary energy surpluses. When these storage devices are full, excess solar power can be fed into the public AC power grid and, conversely, the public grid can safeguard production in the DC smart grid when a shortfall in the power supply needs to be made up.

Daimler is hoping to get successful product developments from the TecFactory into production as soon as possible. "Our Mercedes-Benz plants in Germany are going to be running on a carbon-neutral basis from 2022," declares Schäfer, adding: "New factories in Europe are already being planned with carbon-neutral power supplies. To achieve these ambitious targets, Mercedes intends to digitalize its power grids and switch its production sites to smart DC grids in a step-by-step process.

Michael Scholl, Key Account Manager Automotive International at Rittal, sees the endeavours of the automotive industry as a

key "driver for new technology". The market potential is huge – with more than two million cooling units in operation throughout the whole of Europe. If all these were replaced by Blue e+ units running on direct current, the CO<sub>2</sub> savings would amount to more than three million metric tons. All the same, a lot of work remains to be done before that is achieved. ■

#### **AC/DC in data centers**

Frankfurt's data centers now use more electricity than the city's airport. And that power consumption is still growing. The use of direct current could harness brand new potential for energy and cost efficiency. First and foremost – OCP.

**What is OCP?** The Open Compute Project (OCP) was launched by Facebook in 2011 in an effort to find cheaper, more efficient and fully standardised ways to run data centers. Rittal has supported the initiative from the start and helped to develop the innovative IT architecture for large data centers. Servers and storage systems in enclosures no longer require their own, dedicated mains adapters. Instead, they are powered by direct current supplied via bus bars integrated into the racks themselves.

**Who needs it?** Companies running large data centers that collate data from millions of users on thousands of servers and colocation suppliers. Besides service giants like Amazon, Facebook and Google, the solution is also useful for telecommunications suppliers and large digitalized industrial production sites.

**What does Rittal offer?** Rittal now supplies standard OCP V2.0 racks. Special OCP servers are used in the racks, operating on an electrical supply voltage of 12 V / 48 V direct current (DC). The average efficiency gain is around 5 per cent of total current load. Thanks to the 21" standard dimensions, full use can be made of the interior, and the design is based on the flexible modular model.

# COMMITMENT

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## Four-legged helpers

The Rittal Foundation is helping the Rothaarsteig rescue dog unit upgrade its emergency vehicle.

When someone goes missing, the unit springs into action. There's a call – the team is deployed – the search begins. To ensure the rescue dog unit, based in Driedorf-Seilhofen, could continue to get on the scene as quickly as possible, it had to purchase a new emergency vehicle last year. "We've been saving up for this for a long time," says Annerose Ruhs, First Chair of the Rothaarsteig Rescue Dog Unit,

at the official handover of the new VW T5 bus. However, the small association could not finance the 23,000-euro bus upgrade on its own. "As a thank-you to the rescue team for its outstanding personal commitment, we've decided to contribute 2,000 euros to the upgrade," says Friedemann Hensgen, Chair of the Rittal Foundation. "After all, the 22 rescue dog handlers give up their precious holidays."

Family class

## It's back to school for grandma

Appreciation and sensitivity – this is what pupils and (grand-)parents learn about in the new family class at Mittelpunktgrundschule in Haiger, a weekly lesson where the school brings together families in the classroom. In addition to learning mathematics and German, they also explore how they can help and support one another. "These family classes help foster a relationship of trust

between the pupils, the family and the school," explains Friedemann Hensgen, Chair of the Rittal Foundation. "By providing this financial support, we hope to help expand the initiative." Participants are supported by a multi-family trainer from the Albert-Schweitzer-Kinderdorf child-care facility and a specially trained teacher from the primary school.

+++ Information about the Rittal Foundation can also be found at <https://betop.friedhelm-loh-group.com> +++



Support for mothers and children

## Help that hits home

SOS-Kinderdorf in Gera has been supporting families in difficult circumstances for almost 26 years. For instance, the mother-child residential group alone houses ten young women, who receive essential day-to-day support from the staff – whether that be help with childcare, completing school, or vocational training. The Rittal Foundation made a 5,000-euro donation to SOS-Kinderdorf for its 25<sup>th</sup> anniversary in 2018. The money was urgently needed for repairs to and in the mother-child residential group buildings. But the foundation is continuing to support the renovation of SOS-Kinderdorf this year, too. “The project offers everyday support not only to children, but also to their mothers, providing them with the security, warmth and kindness they never got at home,” says Friedemann Hensgen, Chair of the Rittal Foundation.

US fundraiser

## A quicker way to school

At the National Sales Conferences, Rittal USA donated 20 bicycles to the Houston Area Urban League, a charitable organisation that fights for the equality of African Americans. “The bikes are going to children who live far away from their schools,” says a delighted Brian Brink, Vice President of Industrial Sales.

Charitable project

## No pain, no gain

In July 2018, current and former employees of the Friedhelm Loh Group set an example for inclusion with their tenth collaborative project. They joined forces with several StudiumPlus students and the seniors' club to renovate the garden of the Budenberg School in Haiger with a fully accessible design. They laid kerbs, built new paths and paved individual sections so that pupils with physical impairments can play in the garden, too.

New emergency vehicle

## Safer swimming

According to a recent Forsa study, around half of Germans are not confident swimmers – and that proportion has been growing for years. This makes the work done by lifeguards from the German Lifeguard Association (DLRG) all the more important. To ensure DLRG's 350 employees can continue carrying out their various tasks in the future – from keeping watch over bathers to rescuing swimmers in difficulty and teaching swimming – the Rittal Foundation made a contribution towards the purchase of a new emergency vehicle for the Dill district in Hesse.



Rittal Portugal

## Not out of the woods yet

In 2018, Rittal employees made a substantial contribution to the reforestation work in the Vouzela region. Almost 85 per cent of the forest was destroyed in the devastating fires of 2017. In an attempt to preserve the region's diverse native plant life, the employees traded in their office equipment for hoes, gloves and rubber boots to remove weeds and fast-burning tree species such as eucalyptus from around the roots of trees. They also planted trees, such as cork, birch and beech, that are said to prevent fires from spreading. Every year, Rittal Portugal supports projects that benefit the community.

+++ The Friedhelm Loh Group is once again taking the title of Top Employer of the Year in 2019. +++

# Training with a future



## DIGITALIZATION IN EDUCATION

Students on metalworking and electrical courses at a vocational college in Dillenburg are being trained on a Learning Factory 4.0 – the first of its type in Hesse – to ensure they are ideally prepared for their chosen careers. Andreas Franz shows trainee Marc Weitzel (pictured above) how the system works.

## Learning Factory 4.0

Digital processes have long since become part of our everyday lives at home. And yet, at work, phrases such as "networked processes" and "digital workflows" are still strange and unfamiliar concepts to some. How do high-tech machines work in the age of Industry 4.0?

**Text:** Katharina Weber

Marc Weitzel looks intently at the control system for the Learning Factory. "I haven't done anything with this system before," says the up-and-coming mechatronics engineer as he continues to study the control panel. "But with a little bit of time and effort I'll get to grips with it."

Currently in the third year of his mechatronics course, he's pleased that the digitalization he encounters on a daily basis is being covered at his vocational college. Indeed, there is one thing the 24-year-old is very confident about: "IT is expanding all the time and we're encountering it increasingly frequently. Employers will expect us to be able to cope with that and get to grips with the tasks this involves."

### NEW CHALLENGE FOR EDUCATION AND TRAINING

Industry 4.0 doesn't just present new challenges for employees, it also has implications for apprentices, students, colleges and trainers. It all centres on skilled workers, expertise and competition. If they want to be at the top of their game in the international labour market, then the next generation of skilled workers needs to achieve the standards that will be expected of them in the future. Learning Factories 4.0 have an important part to play in that, particularly at the vocational colleges where tomorrow's workers are being trained. The same standards and opportunities should be available to everybody. "In the past, some students didn't come into contact with the new technology and

control systems, but now everybody has that opportunity," Weitzel explains. Training and instruction is provided on subject matter that training workshop facilities and companies have been unable to deliver on a practical basis, at least until now.

As Weitzel taps the touchscreen to start up the system, it becomes clear that the machine uses state-of-the-art technology. The system can depict and run through virtually all the processes involved in Industry 4.0 production. That includes, for example, machine-to-machine communication. Automated data exchange between machines works without requiring any human intervention. "The CP Factory helps students get to grips with Industry 4.0 based on the interplay and communication between humans, machines and data," says Matthias Hecker, Director of Technical Training in the Friedhelm Loh Group, explaining how the Learning Factory works.

### STUDYING DIGITAL PROCESSES

Industry 4.0 also means offering young people a bright future, whether at home or abroad. The Smart Factory at the vocational college gives apprentices a route to becoming the best-prepared skilled workers in the digitalized industry – including at an international level. Weitzel is in no doubt that the smart factory will help pave the way to a brighter future for him: "Completing my training on a system like this will definitely give me better career opportunities. If I know my way around this system then I can apply that acquired knowledge all over the world. The only difference would be the language, but you can learn that, too."

Weitzel, who is taking his final examinations in June, is optimistic about what the future holds. That is hardly surprising, given how extremely popular Industry 4.0-type projects are in China, for example. In fact, the Huai'an Industrial Park has been operating a learning factory based on the German model since March 2018, under the guidance of the Institute for Automation and Industrial Technology (IAIT) in Hannover and in partnership with the Fraunhofer IOSB-INA Industrial Automation branch in Lemgo. "Produktion" ([www.produktion.de](http://www.produktion.de)), the German-language information-sharing platform for technology and industry, has described the industrial park as effectively building "an ideal bridge between the two countries."

In particular, the dual training system in Germany is setting standards worldwide. Training young people with a combination of theoretical study and practical elements is considered an ideal model and a great advantage – especially by addressing the ►



*"The CP factory helps students get to grips with Industry 4.0."*

**Matthias Hecker**

Director of Technical Training in the  
**Friedhelm Loh Group**



*“Process know-how is important. It’s what companies expect from young people today.”*

**Burkhard Schneider**  
Head of the Industry 4.0  
Competence Centre at  
**Dillenburg Commercial College**

new requirements associated with Industry 4.0. According to OWC-Verlag für Außenwirtschaft GmbH, a German publishing house specialising in international trade, Germany's Industry 4.0 strategy ought to serve as a template for China's "Made in China 2025" strategy. A total of 15 learning factories are to be set up in Huai'an by 2020, with the number due to grow to 40 by 2025, according to the OWC website ([www.ocw.de](http://www.ocw.de)).

That means not only is the Learning Factory in Dillenburg a huge step forward in the training provided in the region, but it also secures an important advantage in the international competition for skilled workers. All the processes involved in Industry 4.0 production can be depicted and tried out. Thanks to the smart factory – financed by owner and CEO of the Friedhelm Loh Group, Prof. Friedhelm Loh – this college based in a modest town on the River Dill will be able to hold its own in the international competition to keep skilled workers fit to face whatever the future holds. Hecker is certain that Digitization 4.0 will soon become standard practice in all metalworking and electrical careers, and he sees the vocational colleges in Dillenburg as the competence centre for Industry 4.0. "We need to make the most of that for the locals and the region," says the training boss, highlighting the significance of the smart factory.

Besides installing intelligent processes, Industry 4.0 also means "increasing interdisciplinary teamwork", as Hecker puts it. He predicts that a range of jobs will have to come together hand in hand in future to manufacture a product. The lines separating those different jobs are shifting and even starting to dissolve, with mechatronics engineers relying on IT specialists and vice-versa to keep a company's production facilities running. High-tech machinery can, for its part, take care of everything else, from receiving the customer's order to dispatching the finished product.

#### **FORGING AHEAD BASED ON EXPERIENCE**

"Process know-how is important. It's what companies expect from young people today," points out Burkhard Schneider, who is in charge of the department at Dillenburg Commercial College responsible for industrial metalworking careers and the college's Industry 4.0 Competence Centre. He says that he and his colleagues have learned a great deal since the Learning Factory 4.0 was incorporated into the college in September 2018. In the working world of the future, there won't be any workplace that doesn't feature

a screen. Software-controlled and smart production processes form the basis for Industry 4.0. These challenges have to be met, particularly given the international competition.

Training for Industry 4.0 will become increasingly important in the fight to win skilled workers. Teaching at the vocational college in Dillenburg has adapted to meet the requirements of the future world of work. Digital content has been incorporated into curricula and Industry 4.0 is an integral part in teaching.

Collaborations between vocational colleges and industry, like this example in Dillenburg, are starting to catch on. Other vocational colleges in Hesse have already been in touch, asking about Learning Factory 4.0, and Schneider is pleased at the response from his peers at other teaching institutions and their interest in his own training programmes. After all, they need to understand these facilities and how to master them before they can pass on the relevant skills and train students. The teaching staff in Dillenburg have adopted a very systematic approach. "We need to learn from one another," says Andreas Franz, Schneider's deputy, extolling the virtues of close collaboration between teachers and skilled workers. The 'plant of the future' run by Rittal in Haiger offers the ideal opportunities to do just that.

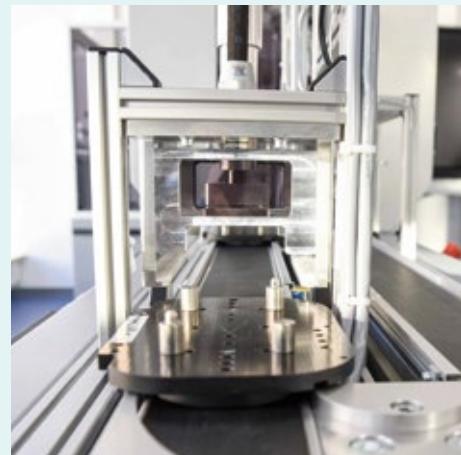
#### **4.0 IS CHANGING EVERYDAY WORKING LIFE**

Dillenburg Commercial College has also started to look into Industry 4.0 training for adults. Industry 4.0 is a world that will increasingly shape day-to-day working life, and it therefore needs to be studied and properly understood. Hecker, the Director of Technical Training in the Friedhelm Loh Group, sums up the situation for companies: "Industry 4.0 will not be limited to production, it will permeate every area of a company." The relevant seminars, workshops and further training courses focusing on digitalization have been developed in-house by the company's Loh Academy.

Bringing the Smart Factory to vocational colleges will open the doors wide for metalworking and electrical careers. The state-of-the-art facilities help make dual training at the college more appealing and will enhance the qualifications of the upcoming generation in the region for cutting-edge technologies. When he officially opened the Learning Factory 4.0, Roland Mandler, Vice President of the Lahn-Dill Chamber of Industry and Commerce, declared that "the entrepreneurs of the future can only benefit from vocational colleges."

## How Learning 4.0 works

A group called "Technology for Buyers" is currently working on a product structure from which the students derive various product variants. The aim is for the students to program a work schedule for their variant, including a corresponding production order for the Learning Factory, and configure the necessary warehouse management and resource operations. At the end of the process, the plant will then manufacture the individual variants.



### REMOTE CONTROLLED.

The touch of a button is all it takes to get the plant running. Marc Weitzel appreciates the training on the Smart Factory. After just a few minutes, the trainee has got to grips with the system.

# EXPERIENCE

**≈75%**

Energy saving  
using a Blue e+  
from Rittal.



Rittal Blue e+

## Cool up top

The cooling units are now available in a roof-mounted version for the first time.

The energy-efficient Blue e+ cooling units from Rittal are now available in a roof-mounted variant, too. Certain components installed in the enclosure, such as the frequency converter, are ideally cooled with cold air from above. The roof-mounted cooling units use a combination of a heat

pipe and conventional compressor technology, which keeps the power consumption low – saving up to 75 per cent of energy on average. A touchscreen display offers an intuitive and convenient means of operating the cooling unit, and the total cooling output is 1.30 kilowatts.

Renovation

## State-of-the-art lock



Rittal system technology is being used to bring Niedersachsen Ports' operations bang up to date with new enclosure, power distribution and IT systems. Following extensive renovation work on the Neeserland Lock – more or less equating to a complete re-build over a ten year period – the facility in Emden, north Germany, is now running on a consistent system approach. Lübeck-based Scholl performed the work using enclosure and power supply technology from Rittal. The project is a best-practice example of an end-to-end value chain. The system draws its power from three low-voltage switchgear that are based on Rittal enclosure technology and include NH slimline fuse-switch disconnectors and fuse-switch disconnectors from the RiLine busbar system. "The system supports the added value from engineering to application," explains Dennis Lehnhardt, Business Unit Manager at Scholl. The consistent system-based approach represents the current state of the art and thus creates end-to-end efficiency and flexibility. "We can therefore reduce our production times and also respond relatively easily to any change of plan mid-project," Lehnhardt explains.

<https://www.ittal.com/riline>

**+++ Stahlo Stahlservice pursuing expansion – new plant opens in Gera. +++**



Proven in practice

## Safe and long-lasting

Battery manufacturer ADS-TEC is using Rittal Blue e+ cooling units to deliver excellent quality for its customers.

ADS-TEC, which is based in Nürtingen, in Germany's Swabia region, specialises in scalable lithium-ion battery storage, housing its products in 20 or even 40-foot containers if customers require. The ideal locations for these systems are remote areas with poor infrastructure. To ensure the batteries achieve the longest possible service life and a good efficiency level, the containers need to be fitted with optimum climate control. And that is where ADS-TEC turns to Rittal Blue e+

cooling units, thanks to their outstanding energy efficiency. These units, combined with the IoT interface, ensure technicians can identify failures in plenty of time and, if necessary, implement countermeasures – without having to visit the site in person. Both the Blue e+ cooling units and the IoT interface are integrated into the in-house cloud-based monitoring solution at ADS-TEC. Further information about Rittal Blue e+ cooling units is available at [www.rittal.com/blue\\_e\\_plus](http://www.rittal.com/blue_e_plus)



Headed for success

# 100,000

VX25 enclosures have been ordered from Rittal. "Our concept is taking off," Project Manager Ingolf Bauer declares, citing the ever-growing levels of interest in the VX25. "The positive trend in orders also shows that our customers feel well-informed. The switchover assistance on the website alone has already been used 18,000 times," he points out. The aim is now to keep this momentum going into the new year, so we can ramp up the switchover rates. A year ago it is the first enclosure system to have been developed entirely based on requirements for increased productivity in panel building and switchgear engineering and on the needs of Industry 4.0 value chains.

[www.rittal.com/vx25](http://www.rittal.com/vx25)

Pioneering partnership

## Practical experience and networking at RWTH Aachen

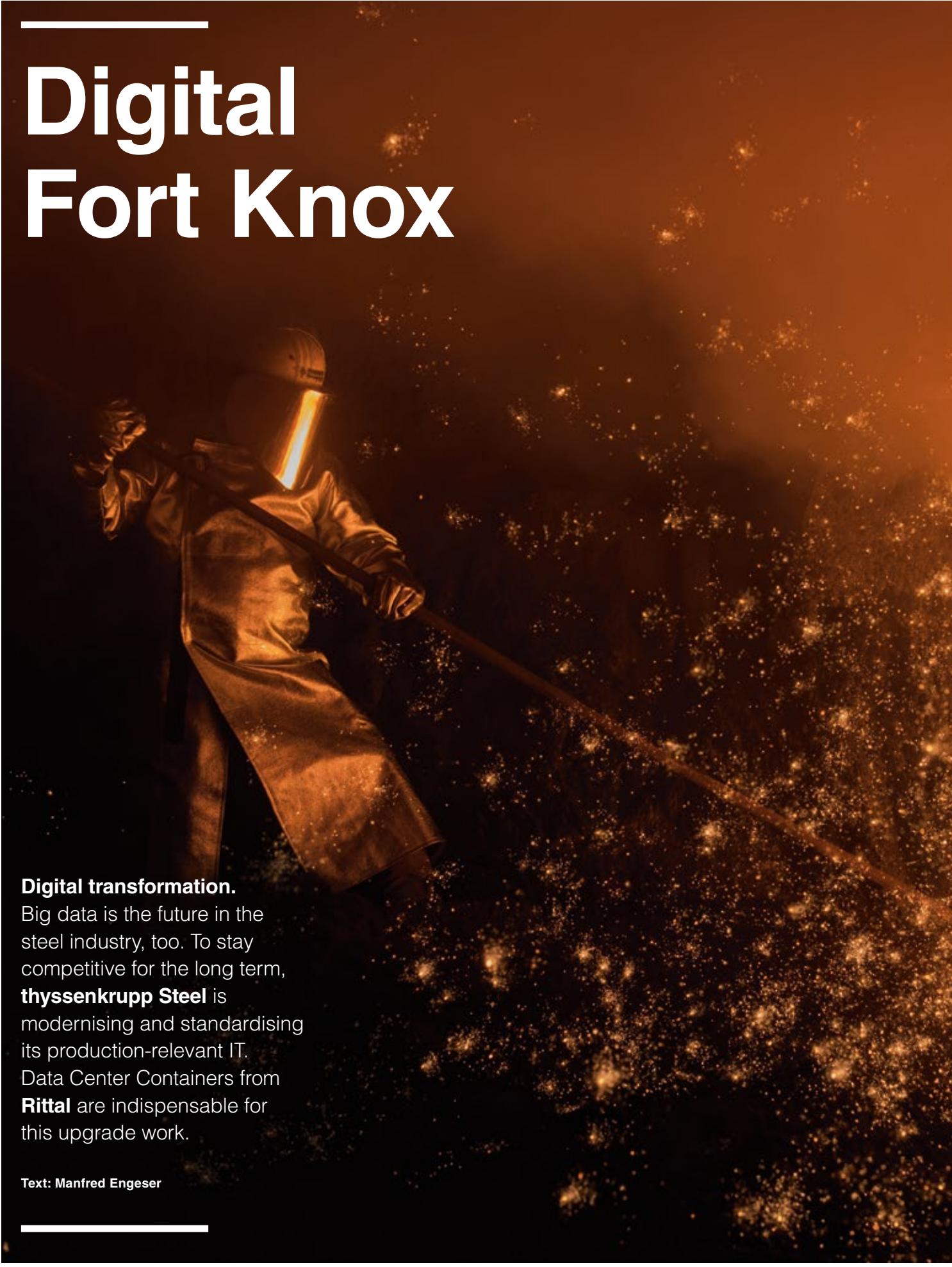
The European 4.0 Transformation Center (E4TC) at RWTH Aachen campus pools specialist expertise from science and technology to implement projects related to Industry 4.0. Eplan is a member of this unique network and is working with collaboration partner PTC to exhibit exciting showcases based on a sorting system at the RWTH Aachen demonstration factory. "The demonstration factory on the univer-

sity campus presents a great opportunity to experience the engineering solutions from Eplan based on a specific example," says Britta Hügen, Account Manager at Eplan in Monheim. "That's why I like to use the demonstration factory and our office space on site to conduct customer meetings that have real added value."



+++ Find out more about FLG in the new online version of be top: <https://betop.friedhelm-loh-group.com> +++

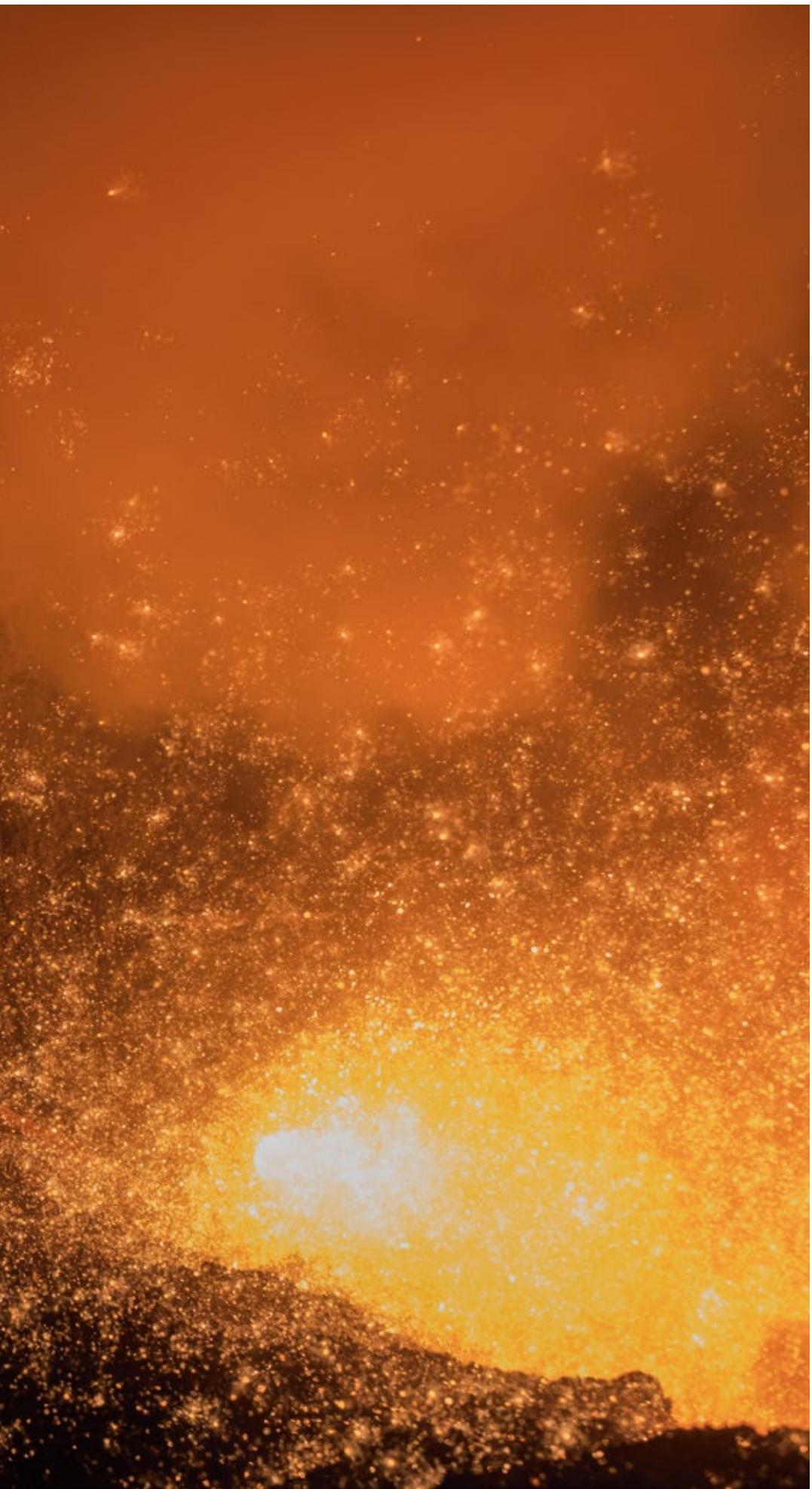
# Digital Fort Knox



## Digital transformation.

Big data is the future in the steel industry, too. To stay competitive for the long term, **thyssenkrupp Steel** is modernising and standardising its production-relevant IT. Data Center Containers from **Rittal** are indispensable for this upgrade work.

Text: Manfred Engeser



**T**hey are 12 metres wide, three metres deep and a good two-and-a-half metres tall. All the same, you could easily walk right past the two white containers without noticing them. Enclosed by a metal fence, they almost seem to be ducking away from the mighty industrial colossus that towers behind them on the site of the thyssenkrupp Steel plant in Duisburg-Bruckhausen. The giant in question is hot strip mill 1, its thick walls surrounded by a network of gas pipes.

Opened in 1955 by the German Chancellor at the time, Konrad Adenauer, and Federal Minister of Economics, Ludwig Erhard, the imposing complex of buildings has proved itself to be an indispensable part of steel production at thyssenkrupp Steel. Three million metric tons of steel ingot are currently processed here every year into high-quality flat steel.

And yet, were it not for the mundane contents of one of these two white sheet-steel containers, this historic plant, which was modernised at a cost of some 300 million euros as recently as 2013, would probably become uncompetitive in the medium term. The floor inside the containers is made of grey rubber, and behind the triple-secured door, along the white sheet-steel walls on the left and right, run two aisles, each measuring only 60 or 100 centimetres wide – just enough to allow easy movement without wasting space. In the centre of the container are just under a dozen racks fitted with precision-wired servers that hum along gently. Seven climate-control devices keep the inside temperature at a constant 22 degrees Celsius. An early fire detection system and extinguisher system using Novec 1230 as an extinguisher gas stand ready to protect the IT infrastructure if a fire should break out. “These containers are the new backbone of our production IT,” Stefan Willing, Technical Project Manager at thyssenkrupp Steel, points out. “They are an important cornerstone for a standardised IT system in our manufacturing department.”

#### DIGITAL TRANSFORMATION IS CHANGING STEEL PRODUCTION

Hot, dirty, noisy and on a huge scale – that's how it used to be. However, the future of steel production at thyssenkrupp looks a little different now – quiet, clean and cool. Digital transformation is playing an ever greater role in the production of more than 2,000 steel products at thyssenkrupp. Whether developing new materials, modifying goods to suit customer requirements – including at short notice – or optimising ➤

#### PURE COMPUTING POWER

The standardised Data Center Containers from Rittal are supporting thyssenkrupp Steel with the digitalization of production-relevant processes.



#### EVERYTHING IN SIGHT

The MicroDCs are completely remotely managed and integrated into the plant's processes. Stefan Willing (left) and Thomas Jahn are already planning further expansion.



logistics and warehousing processes, for companies in the steel industry to stay competitive they must be able to generate data, analyse it in real time and make it available to customers. "Digitalization is increasingly becoming a decisive success factor for us," says Thomas Jahn, Program Lead Secure Smart Factory. "It's about digitizing real processes in the value chain."

Squaring up to the challenges posed by digital transformation calls for an up-to-date IT infrastructure that meets a number of key requirements. It must be located in very close proximity to the production facilities. It must provide reliable access to all the necessary data to ensure production operations run smoothly and seamlessly. It must keep the know-how crucial to the core business inside the company and protect it against physical and virtual attacks. It must be as standardised and self-sufficient as possible to minimise the workload for both in-house staff and external service providers. A digital Fort Knox, in short.

#### **CONTAINER-BASED IT SYSTEM**

The solution is a standard container in two sizes, into which the production IT of each individual facility should be transferred bit by bit. The container should be sited on an easily accessible plot right next to the relevant plant. It should always be assembled and fitted out according to the same plan, with every single part carrying its own article number – from the climate control unit and fire alarm / extinguisher system to the rack itself, and even the precise length and labelling of the cables and connectors. The result is a digital twin that enables both secure maintenance and virtual resource management of the MicroDC. The valuable and sensitive internal workings should be protected at all times by a sturdy sheet steel outer. Added to all that are carefully controlled processes that integrate these containers into the rest of the site. On a local level, there is the underground cable for transferring production data, and the system for converting the 500 V supply used in production to the 400 V required by the containers. Each site should also be incorporated into the group-wide safety and security system that encompasses everything from fire safety through to access control. "The modular containers from Rittal are absolutely ideal for our needs," TKS manager Willing explains.

thyssenkrupp started looking for a solution back in 2016. At that time, the Executive Board had decided to modernise the production-relevant IT infrastructure across



*"The Rittal Data Center Containers are an important component in our security system."*

**Thomas Jahn**

Program Lead Secure Smart Factory  
**thyssenkrupp Steel Europe**



*"The modular containers from Rittal are absolutely ideal for our needs."*

**Stefan Willing**

Head of IIoT Solutions and Applications  
**thyssenkrupp Steel Europe**

the entire group. It also wanted to regain sole control over the most crucial data for the company's competitiveness by bringing infrastructure management back in-house. The executives chose Rittal as a partner that could help them develop a long-term effective solution. After completing a joint analysis phase, the two companies defined the vital specifications, incorporating both the production expertise of the staff at thyssenkrupp and the data center know-how of Rittal.

#### **READY TO GO IN SIX WEEKS**

It took 12 months of preparations before the first container went into operation at the site in Duisburg South. In fact, a pair of containers was installed so that production data can be backed-up in an identical twin with its own power supply. The hard work paid off because, after all the effort that went into installing the first duo at Duisburg South, it now only takes six weeks from placing the order to get another one up and running. The pair at hot strip mill 1 in Duisburg-Hamborn have since been joined by a second and third pair in Duisburg-Beeckerwerth, for hot strip mill 2 and cold strip mill 2. A fourth houses the Management Data Center, where people can keep an eye on how all the other containers are doing. Are the climate-control systems working reliably? Is the power supply OK? Are the servers and IT processes stable?

"Our preconfigured and modular systems for edge computing are helping thyssenkrupp Steel implement new IT infrastructures quickly, safely and economically virtually wherever it wants on the company's premises," explains Michael Nicolai, who is in charge of IT sales at Rittal. "In the same way as a seasoned builder just knows the ideal size, shape and arrangement of individual rooms in a house because he's already built so many of them, planning and building containers like these has also become second nature to us."

thyssenkrupp Steel and Rittal already have site number five in view – Dortmund-Westfalenhütte. Alongside cold strip mill 3, the new galvanising plant there is to be enhanced with state-of-the-art production IT from May 2019. The Bochum and Siegerland sites will then complete the programme. "Our experience with Rittal containers has been extremely positive", says the project leader. "They are our factory standard and an elementary component of our target architecture for our production IT." ■



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# The door-opener

**SAP.** Netherlands-based **Boon Edam** helps visitors get into museums, airports and shopping centres. And **Cideon** is opening the door to whole new system worlds for the Dutch company.

Text: Annika Pellmann and Gregor Karasinski

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**W**ednesday afternoon, 2 p.m. Time for a bit of culture. At least, that's what plenty of people from all round the world seem to have on their mind right now in Amsterdam. The large revolving doors at the entrance to the Rijksmuseum never seem to stop turning. Art fans, groups of tourists and people just popping in – all of them step into the automatic doors and re-emerge into a whole new world. The stone arches of the entrance hall arc imposingly over the visitors as they make their way to the exhibition halls. A blond girl clad in a blue dress – most likely an aristocrat – gazes down benevolently from within her ornate frame. A huge swan lunges forward so aggressively that you can almost hear it hissing. You don't need to be an art aficionado to appreciate the wonder of these pieces and get a sense for the brilliance of their creators. Boon Edam is the company tasked with ensuring everyone can enter this world – as well as airports, hotels, shopping centres and many other places besides. The Dutch company, based in Edam, specialises in manufacturing revolving doors, turnstiles, sensor-operated portals and access gates. Its products are not just in high demand in the Benelux countries, either, with the family-run company operating around 20 international subsidiaries and marketing its range in more than 50 countries.

#### DATA AS THE SECRET TO SUCCESS

"The engineering work is done at the headquarters in Edam while our production plants and additional development teams are spread out over various sites in the Netherlands, China and the USA," explains Marcel Schilder, Global IT Manager at Boon Edam. However, all this exciting diversity in a rapidly growing company also brings a whole range of challenges, with the very heterogeneous IT landscape being a case in point. Over the years, a product data management environment and various system islands have evolved in engineering – but with no standardised database. To ensure this didn't "jam the doors" in the face of growing international competition, Boon Edam brought on board Cideon in 2017. The aim was to introduce process automation and digitalization to drive up efficiency. Achieving that meant creating one database that could be used seamlessly internationally and embedding it into a holistic Enterprise Resource Planning (ERP) system from SAP. The solution Cideon came up with involved full integra-

tion of Product Lifecycle Management (PLM) based on SAP S/4Hana, the ERP standard of the future. "It takes more than just a few days to fully integrate SAP into an existing IT environment," points out Tina Stürke from the EMEA sales team at Cideon. "The first step is usually to carry out workshops on site with the customer and involve a range of departments, from engineering to procurement." It soon became clear that locally created data needed to be made available across multiple sites. Another key requirement besides a stand-

principal Consultant at Cideon, sums up the next stage in the consulting process: "We created an initial prototype based on the findings from the workshop. Our customer was able to test out a rough version of the subsequent solution really early on, in what is known as a sandbox environment. They were then able to advise us as to how everything was running and what still might need tweaking." Cideon incorporated this feedback into the solution, which was then finalised in close collaboration with the customer. Only then could work commence on actually implementing the system. "We started at a single site and are currently preparing the roll-out at two more," Hille explains. "That's still not the end of the job, though. We also offer in-depth training for staff working with the solution on a daily basis."



*If you want to thrive in this competitive environment, you need to deliver quality and get to grips with efficiency pressures."*

**Marcel Schilder**

Global IT Manager at **Boon Edam**

arized database was providing various teams with access to data based on the distribution of rights. Boon Edam was also especially keen to integrate a product configurator for customers that had already become established on the market. Step by step, the consultants and IT specialists at Cideon worked with the company to develop the optimum solution. Dirk Hille, Prin-

#### THE SOLUTION IN DETAIL

The new PLM solution at Boon Edam allows users to adopt drawings based on Autodesk Inventor automatically into SAP. This creates a central source for locally generated data with cross-site access throughout the company. To achieve this, Cideon implemented SAP Engineering Control Center (SAP ECTR), the SAP PLM integration platform for authoring tools and the corresponding integration for Autodesk Inventor. The set-up was customised to harmonise Boon Edam's product configurator with the new system. In the future, drawings and documents for procurement will also be automatically generated according to set rules and compiled to suit the specific context. What's more, converter technologies from the Cideon Conversion Engine allow Boon Edam to supply drawings based on Autodesk Inventor to non-CAD workstations in other departments and even external partners – using general formats such as the classic PDF. This ensures data can be read across the whole company, regardless of which application has been used to create it, such as CAD systems. "Now that we've integrated the M-CAD environment into SAP and trained the key users, the project at Boon Edam is nearing completion," Hille points out. "Our globalised environment means there are lots of potential customers – but the competition is getting increasingly tough, too," explains Schilder. He is in no doubt that "if you want to thrive in this environment, you need to deliver top quality and get to grips with the growing time and efficiency pressures." The new system solution makes the company fit for the future. ■

# Really saving energy

**Blue e+ chillers.** More than 15 per cent of the energy consumption associated with machine tools goes on cooling. Chillers from the **Rittal** Blue e+ series efficiently reduce this energy consumption, as the test installation in a CNC lathe at **Bosch Rexroth** in Elchingen, Germany, has shown.

Text: Ruth Lemmer

**O**ne small step, but a giant impact for GoGreen. Scientists from PTW Darmstadt unpack their measuring equipment in the workshop. Working by hand, they install their electricity meters on four CNC machines at the Bosch Rexroth production plant in Elchingen. The devices are a neat way of showing how much electricity is being used to cool the machines and keep them running smoothly. The rest of the work is done far away – data on the current flows is sent back to the university, where the scientists perch in front of their computers, eagerly evaluating the measurements.

Bosch Rexroth has set up the in-house energy management consultancy GoGreen at its headquarters in Lohr am Main. The group, which has a global workforce of just

under 30,000 employees, wants to ensure it is operating on an energy-efficient basis. GoGreen has developed a universal system – dubbed Rexroth 4EE (Rexroth for Energy Efficiency) – that all the group companies can use to lower their CO<sub>2</sub> emissions. The consultancy also participates in research projects – such as the ETA-Transfer project led by the Institute of Production Management, Technology and Machine Tools (PTW) at Technische Universität Darmstadt, examining the energy efficiency of machine tools used in production. “The aim of projects like this is to find solutions that will boost energy efficiency and can also be implemented on a practical level,” explains Leo Pototzky, GoGreen Project Manager at Bosch Rexroth.

The Elchingen plant run by Bosch Rexroth makes hydraulic pumps that help keep construction machinery, agricultural equipment and forklift trucks moving. Various components for the axial piston pumps are manufactured on a DMG GMX 250-type CNC lathe. “In November 2017, as part of the Transfer project, we retrofitted a new Blue e+ chiller from Rittal to one of the four CNC lathes,” Pototzky recounts. The lathe has a total connected load of 75 kilo-volt-amperes and is run in three-shift operation four to six days a week.

## ENERGY EFFICIENCY WINS OUT

On the face of it, nothing has changed. The machine operator does the same as always – enters the workshop and walks from lathe to lathe, checking on the display that chips are being removed with millimetre precision from the metal workpiece in the gigantic drilling machine. After all, the new additions retrofitted to the CNC lathe are buried deep in its inner workings. That’s where the Blue e+ chiller feeds in the cooling medium, which flows through the spindles that conduct the heat away from the drive technology. In the chiller, an inverter-controlled DC compressor generates the cooling output needed. To ensure the machine tool’s enclosure is also efficiently climate controlled, the existing compressor cooling unit was replaced by a device from the Blue e+ series, too.

The scientists at PTW Darmstadt measured and precisely documented the energy consumption both before and after the retrofit. A distinction was made between two operating statuses on the machine – working and operational, i.e. when components are being machined as opposed to when machine tools or components are being changed. To ensure the scientists

could carry out a detailed analysis, the consumption of all the units in the machine was measured separately and over the course of a week. The main difference in the energy consumption between the two machine statuses lies in the power consumed by the drive train and the system for supplying the cooling lubricant.

The results were impressive. The new Blue e+ chiller consumes a good 50 per cent less electrical energy than the old recooling system, while the saving achieved by the cooling unit in the enclosure even exceeded 80 per cent. "If we project that over the course of a year then, depending on the capacity utilisation of the CNC machine, we get a saving of more than 10,000 kilowatt hours," Pototsky calculates. "This example shows us just how much potential is still waiting to be tapped"

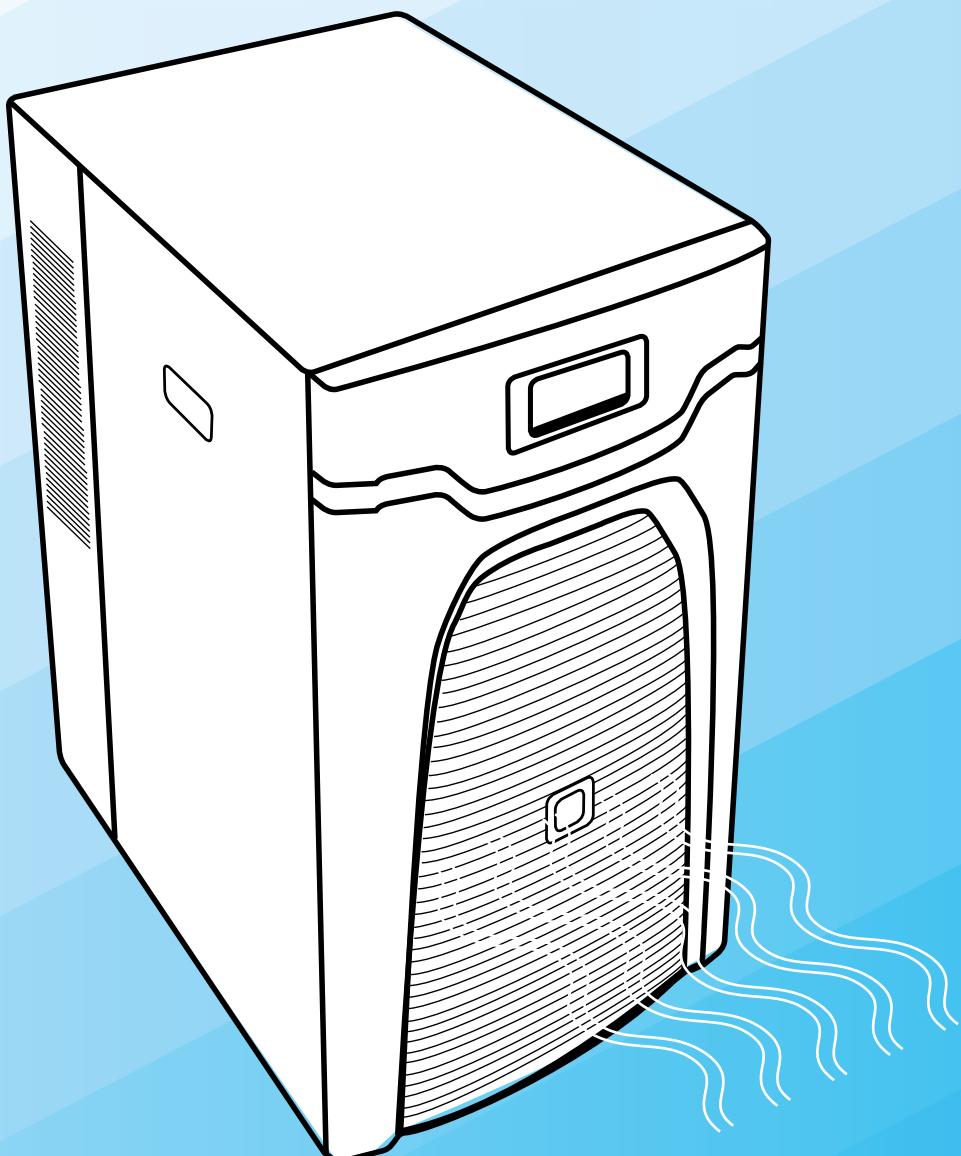
in lots of areas." Another positive effect is that the temperature accuracy of the refrigerant flow, which amounted to more than two degrees Celsius on the old recooler, has been improved by the new Blue e+ chiller to +/-0.1K when in steady state. This can have a positive impact on quality when manufacturing precision-turned parts.

By enhancing energy efficiency, Go-Green has been able to identify an annual potential saving of 14 million euros for the Group – a saving of up to 50 per cent for each plant. The energy-efficient chillers and compressor cooling units in the Blue e+ series are already playing their part in realising those savings at the Elchingen plant. Go-Green is not only taking shipping companies, the food sector and movie production by storm – it's also making its mark in mechanical engineering. ■

## Flexible performance classes

The all-important energy efficiency parameter for cooling is the Energy Efficiency Ratio (EER). This defines the ratio of cooling output to the electrical power used. The higher the EER, the better. Conventional chillers that use hot-gas bypass control exhibit an EER of 1. The new Blue e+ chillers from Rittal achieve an EER of up to 4. At the heart of this efficiency enhancement is a variable-speed compressor that always provides just as much cooling output as is currently required. Rittal uses precisely controlled DC synchronous motors to drive the compressors. This ensures the Blue e+ chillers run at optimum speed, saving up to 70 per cent of energy compared to chillers using hot-gas bypass control. Another technical innovation is the micro-channel technology in the heat exchangers, which helps reduce the volume of refrigerant used by up to 55 per cent and thus benefits the environment.

The Blue e+ chiller series comprises three models with cooling outputs of 2.5, 4 or 5.5 kilowatts. An integrated flow sensor in the cooling medium circuit and fill level monitoring further boost reliability. There is also an overflow valve installed in the cooling medium circuit that opens automatically as soon as the cooling medium circuit is closed at the point of use. A filter mat monitoring system promptly notifies the user when the filter mat needs to be replaced. The units can be used worldwide with all common mains frequencies and voltages – and are very user friendly. The control panel, which features a touchscreen display, depicts all messages in plain text – and in 21 languages. The Blue e+ app transmits data wirelessly, while RiDiag III parameterisation and diagnosis software can also be used with the new series via a USB connection or by linking up to the IoT interface through a range of network protocols.



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A DRAGON UNLEASHED

Rittal built a data center in record time for Chindata.

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**IT infrastructures  
flourishing in China**

## Faster cloud access.

China's Internet economy is driving growth, with new, innovative business models emerging at record speed.

**Rittal** is helping IT companies such as **Chindata** build new hyperscale data centers in the shortest possible time to satisfy the digital world's hunger for data. Discover in this article how Rittal experts completed one of the largest data center in China in just seven months.

Text: Kai-Uwe Wahl

The large number of new digital business models means the Chinese economy needs IT services that offer flexible access, but companies are reluctant to build and operate their own data centers. A planning and construction phase of up to two years would simply be too long in the fast-moving Internet world, so demand for scalable IT services is growing. The cloud offers a whole range of as-a-service solutions that are available with a few clicks of the mouse – from infrastructure services such as storage space and computing power to complete business applications. The huge demand for cloud services is reflected in the latest economic data. In 2018, for example, the market for cloud data centers enjoyed double-digit growth in all regions of the world and expanded by as much as 88 per cent in China. There is currently a real boom in the construction of new data centers in China. The number of hyperscale data centers required for cloud services is growing particularly fast. In 2018, there were already as many as 430 of these centres in operation worldwide, more than 30 of them are in China. A further 130 such data centers are being planned around the world. The server infrastructure of a hyperscale data center is designed for maximum scalability to satisfy customers' constantly fluctuating demand for IT capacity. Large cloud providers operate their data center with a hyperscale infrastructure comprising thousands of largely identical computers that adapt dynamically and automatically to current requirements.

### THE QUICK AND EASY ROUTE TO A NEW DATA CENTER

Rittal experts are helping data center operators in China design new centres and build them quickly. One of these customers is the Chinese cloud and data center provider Chindata. The challenge of the project with Chindata was getting a new data center up and running as quickly as possible to meet the market's high demand. The company selected Rittal as its implementation partner. "In cooperation with Rittal, we have succeeded in building a brand new hyperscale data center in the record time of just seven months. The expert consultants at Rittal provided us with innovative ideas for the cooling concept and the modular structure of the IT racks from the outset. They also oversaw the entire process," says Jessica Song, Vice President Director Planning and Design Academy at Chindata. Chindata already operates five data center at strategic locations in China – including

### Technical details of the hyperscale data center for Chindata

Rittal installed a modified version of the Rittal TS 8 enclosure system in the new Chindata hyperscale data center. The IT racks have 52 height units in this model variant. Intelligent power distribution means Chindata can control individual modules in a targeted way and use the monitoring function to record energy consumption very precisely. Hot aisle containment with indirect, adiabatic cooling units is being used to cool the IT systems so as to optimise energy efficiency. All in all, at 1.12, the PUE (power usage effectiveness) value of the system surpasses the statutory reference value of 1.4 set by the Chinese Ministry of Industry and Information Technology. Over 8,000 Rittal TS 8 IT racks and more than 250 hot aisle containment units have been installed, which makes the data center one of the biggest in China.

Beijing, Shenzhen, Shanghai, Shanxi and Hebei – as well as a further 220 smaller centres. Covering an area of more than 130,000 square metres and with an IT capacity of up to 16 megawatts, the new Guanting Lake New Media Big Data Industry Base ranks among China's largest data centers. One of the success factors in its rapid construction was the precise planning and coordination between the team in charge of building operations and the experts from Rittal. This ensured work could be carried out on the data center components in parallel to the construction phase, for example. Rittal gradually installed pre-configured modules in the data center as building work progressed. This tightly synchronised approach and the modular concept ultimately made it possible to complete the new data center in record time.

Chindata is already planning to build more cloud data centers and will continue to work with Rittal as a solutions partner. ■



A video of the chindata data center is available at:  
[www.bit.ly/betop-chindata-en](http://www.bit.ly/betop-chindata-en)

# Efficient consultation

**Process optimisation.** Lots of companies use copy and paste in their day-to-day business. However, when it comes to designing circuit diagrams, it's an error-prone strategy. Some processes still involve manual work, which is reason enough for customers to re-examine their own user steps and introduce some improvements. **Eplan** doesn't leave customers to their own devices when they are looking to buy a software solution. Instead, it adopts a focused approach, teaming up with its customers to develop bespoke solutions.

Text: Eva Neuthinger

We are in the middle of optimising our processes from engineering through to production to gear them up for Industry 4.0." explains Ludwig Finzel, Head of Project Support at Wieland Electric GmbH, one of the world's leading manufacturers of safety controls and safety sensor technology. "We recently invested in new machines with the aim of expanding our global presence," Finzel explains. The medium-sized family company headquartered in Bamberg, Germany, worked with Eplan to analyse its current working processes and identified areas where improvements could be made. Experts from both businesses attended workshops to lay the groundwork for efficiency improvements. It turned out that the company had not yet fully utilised the opportunities presented by the Eplan software it was already using. Another aspect that Eplan and Wieland mechanics and production staff identified was that the company develops its own switch boxes and enclosures using a 3D software package. In the past, the manufacturer had designed the circuit diagrams separately using Eplan software, but had never linked up the two software packages.

#### OPTIMISED PROCESSES

In the end, the participants in the joint workshops concluded that the production of switch boxes at Wieland should be more automated from design through to production. "We identified the data that production requires and what the processes should ultimately look like," reports Marc Ackermann, Account Manager at Eplan in Munich. The aim was to significantly reduce the workload in production. The solution involves transferring the 3D enclosure drawings via an interface to Eplan so they can be processed further using Eplan Pro Panel.

This also includes the virtual wiring of the components, with the software supplying the digital prototypes in 3D, stipulating exactly how each wire should be laid and automatically gauging the necessary length of the wires. Previously, all that was done manually. Eplan Smart Wiring is also used in production, providing a solution that guides workers step by step through the wiring process. "This simplifies work to such an extent that even colleagues with little experience can now wire the switch boxes," Ackermann points out. Burnell Switchgear & Control, a manufacturer of power distribution systems, is another customer that Eplan works with. The company aimed to create more efficient processes

#### End-to-end concept

Eplan Experience covers eight fields of action. Eplan endeavours to help customers help themselves in any areas where the two parties have identified the potential to boost efficiency.

- |   |   |
|---|---|
| <b>1</b><br><b>IT infra-structure</b>                 | <b>2</b><br><b>Using the Eplan platform</b>                     |
| <b>3</b><br><b>Creating standards</b>                 | <b>4</b><br><b>Improving the product structure</b>              |
| <b>5</b><br><b>Automatically generating documents</b> | <b>6</b><br><b>Optimised workflow in the production process</b> |
| <b>7</b><br><b>Standardised process integration</b>   | <b>8</b><br><b>Project management and communication</b>         |

by rolling out an end-to-end CAE system. "We realised that we need a solution that improves our technical operations and helps us optimise our production process. That's why we went to Eplan," Project Manager Piotr Wozniak recalls. "Once the experts from Eplan had seen how we work, they suggested that we came to Germany to visit the Rittal Innovation Center in Haiger. The solutions we saw there really won us over." Like Wieland, Burnell ultimately opted for a combination of Eplan Pro Panel and Eplan Smart Wiring to optimise the planning and production of their enclosures and switchgear. Burnell also decided to acquire a Rittal Perforex to automate enclosure machining. Wozniak is well aware of the productivity boost: "We can reduce individual

worksteps in production from several hours to a few minutes."

"Even though we offer assistance, we also like to provide training so customers can help themselves," explains Markus Jaensch, an expert for Eplan Experience. Eplan consultants are often called into companies to work with staff on establishing a basis for using the software more efficiently. However, companies don't always have to acquire new software in order to harness potential improvements. Eplan offers businesses collaborative workshops for analysing and then optimising their current working processes. The following questions are the most important to consider when starting out: How efficiently do the companies believe they are working? And, as a percentage, to what degree are they utilising the potential of their existing Eplan software? "It doesn't usually take long to get the answers, as most companies are aware there's room for improvement. Then we talk about exactly how Eplan can be deployed in the company."

#### STANDARDISATION IS KEY

One typical example of self-help is the generation of macros – a way to standardise the creation of circuit diagrams. Eplan can provide very specific assistance to optimise this process, or even create a comprehensive macro library in the software. This has numerous benefits. For example, project elements that crop up time and again can be stored as macros and then simply reused. That means not having to start from scratch every time. What's more, if the macros have been set up properly, users can completely avoid common copy-and-paste errors. In a nutshell – a well-stocked and curated macro library offers a sound basis for automated engineering. If required, Eplan Cogineer can be deployed to take this to the ultimate level, i.e. automatically creating circuit diagrams, virtually at the touch of a button. "Once we have optimised the processes and added solutions, we continue to support the company. We offer subsequent staff training, because we want to ensure the workforce accepts and utilises the chosen improvement measures, so that their work actually gets easier," Jeansch points out.



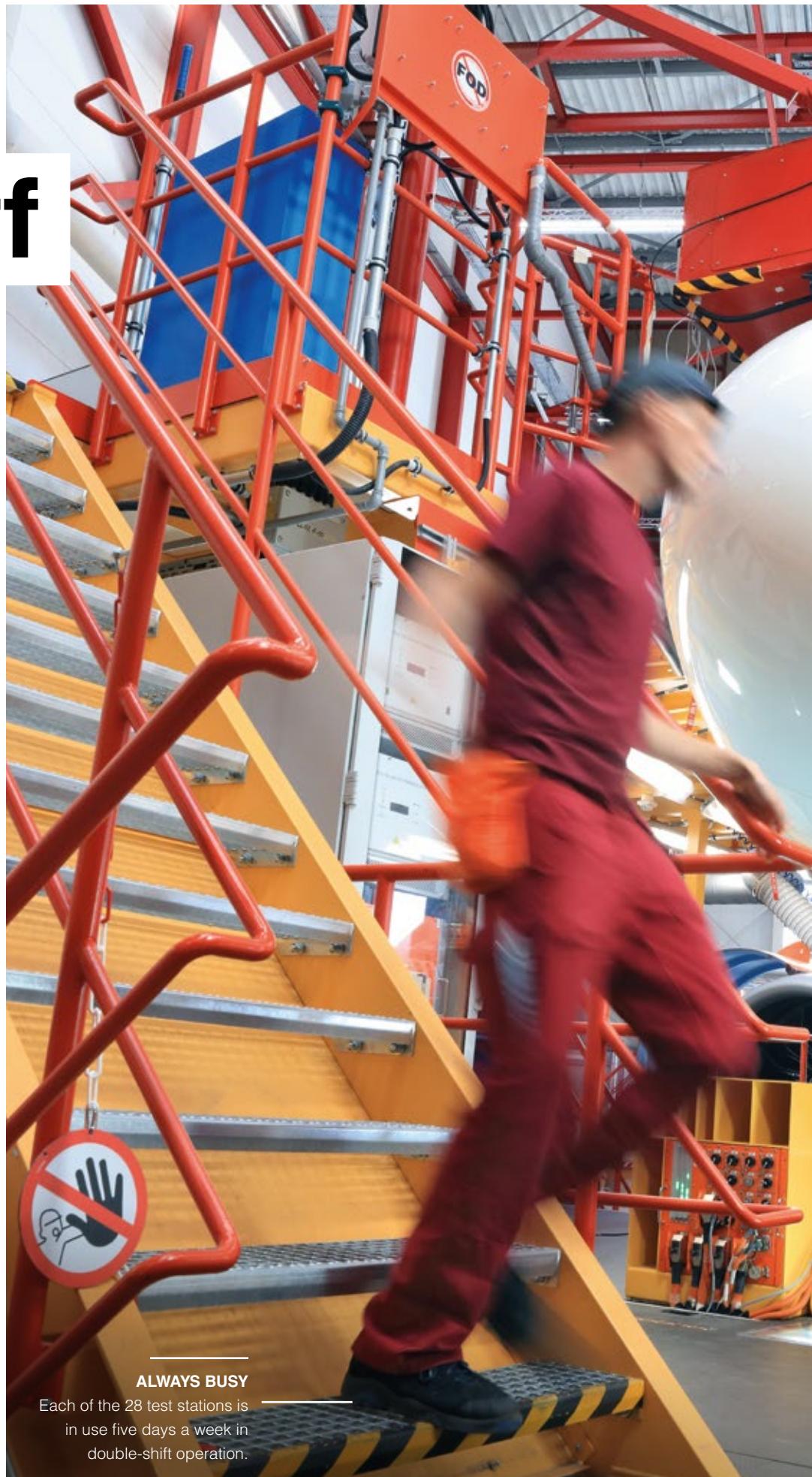
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# A safe take-off

## Aircraft manufacturing.

Before a brand-new A320 can be put to work ferrying holiday-makers to sunnier climes, the aircraft has to pass some serious testing at **Airbus**. However, it isn't just the aircraft that needs overheating protection to make sure it runs like a dream – the testing hardware needs proper protection, too. Airbus uses Blue e+ cooling units from **Rittal** to keep its testing facilities in tip-top condition.

Text: Dr Jörg Lantzsch



### ALWAYS BUSY

Each of the 28 test stations is in use five days a week in double-shift operation.



The two Airbus workers sit on simple stools in the cockpit of the new Airbus A320, as the pilot seats have yet to be installed. Through the cockpit windows they see not clouds, but four monitors displaying the "ground test instructions" they need to work through. "We simulate all the flight movements here at the final assembly line," explains Volker Jacobs, Head of Ground Testing on the fourth final assembly line of the A320.

However, the first tests start much earlier. As soon as the fuselage sections of a new aircraft have been assembled, the cables are laid there – and tested. All along the various assembly stations, all newly installed components and systems are immediately tested to ensure they are fully functional. Depending on the configuration of the aircraft in question, the full set of tests for an A320 can take around 400 hours to complete. The majority of these are carried out in Jacobs' department. Fuelling, taxiing, take-off and landing together with various flight manoeuvres are all simulated on the final assembly line. "Our engineers could fly the aircraft, even though they're not pilots," the Head of Ground Testing points out. All functions that are essential to flight safety on the Airbus must be 100 per cent reliable. Only when an A320 has passed all these tests with flying colours can it be sent for delivery and take off from the runway at the Airbus plant in Finkenwerder on its maiden flight.

#### SIMULATING OPERATION

The tasks carried out on the final assembly line include the complete fit-out of the cabin. "Once again, we check everything – from the headphone sockets and in-flight entertainment screens on each individual passenger seat right through to the coffee machine in the galley," says Jacobs. Testing all the onboard functions requires high-performance hardware that is connected up to the sensors and actuators of the aircraft and used to run complex simulation programs. A total of three computers are needed for the simulations. Each computer is equipped with additional hardware that links up to the components in the aircraft. Lengths of cable as thick as a human arm reach from enclosures containing the simulation computers to the insides of the aircraft. This makes it possible to simulate parameters such as engine speed and the signals from the speed measurement devices. The computers also capture output signals, primarily voltages and volume resistance.



**HAPPY CUSTOMERS** Volker Jacobs (left), Head of Ground Testing at Airbus, and Werner Wohlfart (right), Key Account Manager Aviation at Rittal, are pleased they opted for the Blue e+ cooling units for the functionality tests on new aircraft.



**AN ICE-COLD MARATHON** Cooling units in the Blue e+ range run continuously and stop hardware from overheating.



**DIGITAL VIEW** No stunning aerial vista for the engineers: Monitors are mounted in front of the cockpit to display the ground test instructions.

## Service gets smart

Rittal is taking another step forward in digitalization with the Smart Service Portal. Service delivery can be accelerated and improved by digitalizing the industrial maintenance processes for Rittal cooling units and chillers from the Blue e+ generation. The new service portfolio benefits customers by taking some of the strain off their own maintenance teams when it comes to monitoring activities that do not add value.

The core elements of digitalization are networking, virtualisation and useful data handling. The Smart Service solution calls for devices to be networked via the internet using an IoT interface. This ensures operating data can be recorded continuously and mapped via the Smart Service Portal. A central, cloud-based data storage system makes big-data analyses possible. This data evaluation can then be used as a sound basis for deriving relevant recommendations.

Rittal offers innovative services and new business models through its new cloud-based and automated infrastructure management. Customers benefit from maximum machine availability and low, plannable service costs.

*"The Blue e+ cooling units run all day. The quality is right and the customer service we get from Rittal is excellent"*

**Volker Jacobs**

Head of Ground Testing at **Airbus**

Airbus developed the simulation computers, which are installed in a Rittal enclosure on the test bench, in-house. The hardware generates a lot of heat when in use and therefore needs to be cooled – the voltage transformers in particular, which are needed for the connection to the components in the aircraft, can get very hot. "In the past, before we started using active cooling systems for the computers, they often crashed during the summer," Jacobs recalls. Given how tightly and carefully co-ordinated the production schedule is at Airbus, that simply could not be allowed to continue. The enclosures were fitted out with active climate control systems in 2006 to avoid precisely such downtime. Today, there are 28 of these test stations in the Airbus plant, all similarly configured. What's more, all are fitted with Blue e+ cooling units from Rittal to protect the sensitive hardware from overheating. The reliability of the Blue e+ units is particularly important to Airbus. "If the cooling systems for the simulation computers were to fail, we wouldn't be able to conduct our tests," Jacobs points out. The test bench is in use at least five days a week in double-shift

operation. "We switch on the cooling units in the morning and they run with absolute reliability," he says. The cooling systems at the test benches are monitored and, should a unit still somehow fail, a warning light comes on to alert staff.

### GUARANTEED ENERGY EFFICIENCY

The idea to upgrade to the energy-efficient Blue e+ cooling units came about while working on energy management for the ISO-14001 certification. Rittal Support gave Airbus crucial assistance during this process, as Jacobs explains: "Thanks to the energy efficiency calculator, we were able to work out in advance how much energy we would save by upgrading to the new cooling technology."

Well-timed maintenance is crucial to ensuring the cooling units run reliably and efficiently. The main causes of failures are critical component statuses and external influencing factors. Networking the units with the IoT interface ensures the condition of all cooling units is reported to overarching systems. Maintenance teams can then promptly plan the necessary measures

and carry out the work at the most appropriate time. These benefits can be taken to the next level in the future by linking up to Rittal's Smart Service Portal. The networking between the devices and continuous status monitoring ensure critical operating statuses can be identified early on.

The senior managers at Airbus were also impressed by how user-friendly the cooling units are. All parameters can be adjusted easily, using the two buttons on the control panel, and the display depicts status and error messages in clear language. "The quality is right and the customer service we get from Rittal is excellent," Jacobs concludes. Based on this positive experience, the test benches at the Airbus sites in the USA and China, which are configured in exactly the same way, are also being retrofitted with the new Blue e+ cooling units. ■



More photos of Rittal and Airbus at:  
[www.bit.ly/betop-airbus-en](http://www.bit.ly/betop-airbus-en)

ISSUE 02|2019

# A winning team

What would Sherlock Holmes be without Dr Watson? The two probably best known detectives of world literature are only able to solve tricky criminal cases as a team. Like Yin and Yang, these completely different characters complement each other.

By the same token, Eplan and Rittal jointly support customers in solving their tricky cases as do the two brilliant minds Holmes and Watson. The two companies work together with their customers to find the best solution for the end-to-end streamlining of manufacturing processes.

FIND OUT MORE IN  
THE NEXT ISSUE  
OF BE TOP.



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### **BE TOP**

Magazine of the Friedhelm Loh Group  
Issue 01/2019  
ISSN 2195-3198

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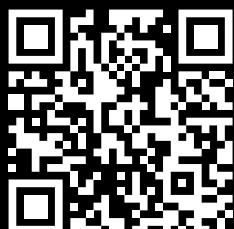
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