Rittal – The System.

Faster – better – everywhere.

Everything under control

Rittal Smart Monitoring for IT and Industry 4.0

ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL | IT INFRASTRUCTURE | SOFTWARE & SERVICES

FRIEDHELM LOH GROUP

No two companies are the same

That is why Rittal's flexible monitoring solutions can be precisely scaled to provide a range of application options. Smart monitoring automates all monitoring processes, and identifies and resolves any critical changes before they become serious problems. It also gives detailed insights into the availability and performance of your systems and provides effective functions to help you tackle everyday IT management challenges.

Smart, flexible, efficient

Continuous monitoring is a critical success factor. It saves time and money in the value creation process, helps prevent errors, and helps to improve productivity in a sustainable manner. Automated monitoring of networked production systems improves process reliability at all levels and enhances machine and tool availability with seamless information transparency.

Greater productivity with continuous monitoring

Around

70%

of data logged today will remain **unused.** [1]

In the same way that a company is only as strong as its workforce, IT infrastructure is only as effective as its control mechanisms. Every data centre has a clearly defined availability. By promptly identifying any deviations from target values, availability and resource consumption can be regulated to ensure cost-efficient, reliable operation. To this end, all parameters must be recorded, critical deviations identified, and presented in conclusive system contexts.

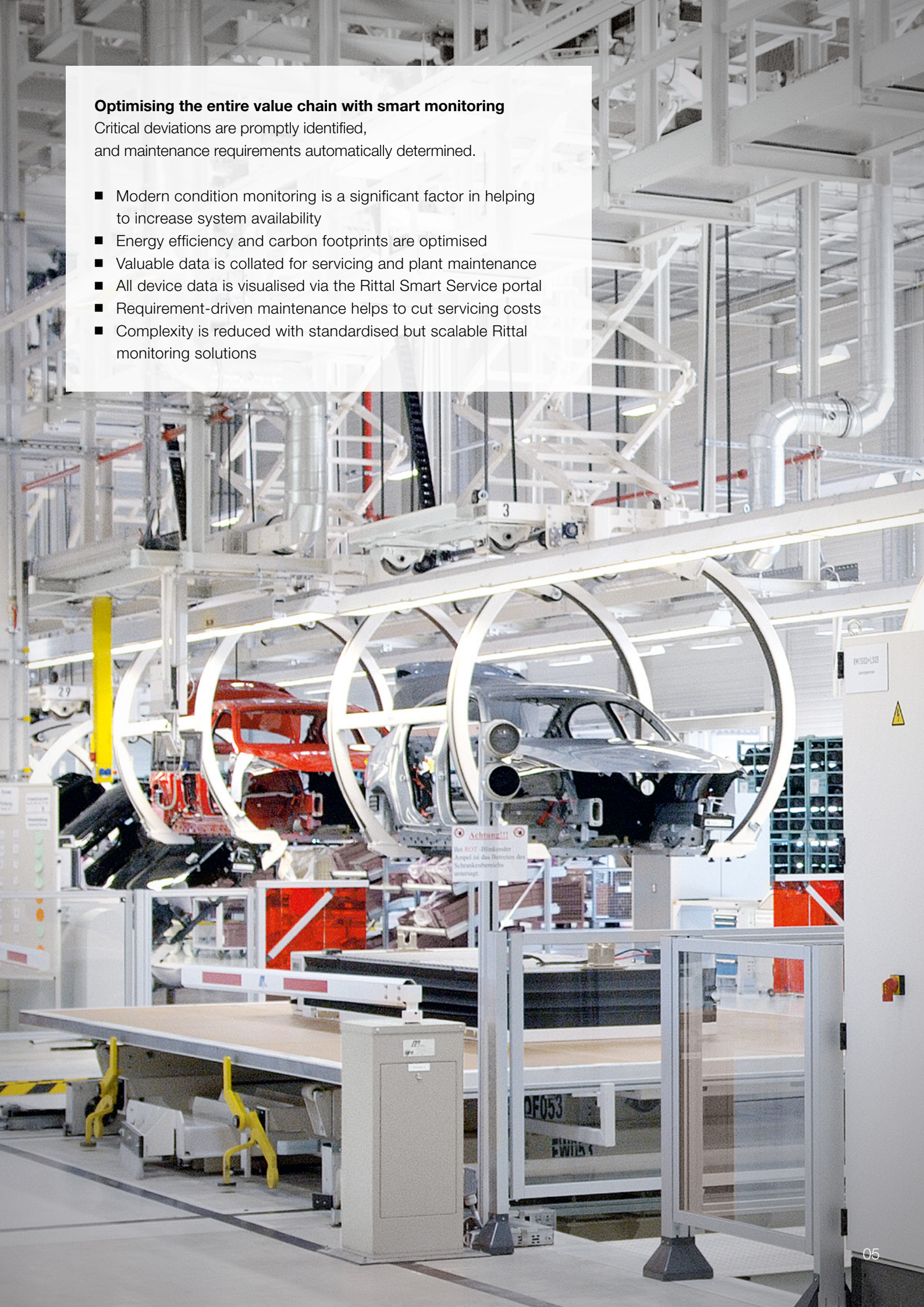
Predefined workflows and alarm scenarios make it possible for an automated response to any anomalies. If a critical situation does arise in the IT infrastructure, end-to-end digitisation allows processes and services to be relocated without interruption. These mechanisms help to safeguard the service level agreement (SLA), even if the IT infrastructure is lacking the requisite redundancies.

Measurable efficiency gain

The IT landscape influences all areas of the company and offers huge potential for optimisation. Installing IoT/IIoT sensors facilitates the exchange of information between the physical and the digital world. This allows continuous, real-time monitoring of all processes, so that any deviations can be identified promptly and automatically rectified.

Whereas in the past, optimising the PUE (Power Usage Effectiveness) rating was considered sufficient, with smart monitoring it is now also possible to pinpoint and eliminate other hidden costs. IoT/IIoT, edge computing and predictive maintenance enable the continuous logging and analysis of all relevant production data to enhance reliability and energy efficiency while at the same time cutting costs.

1 World Economic Forum + A. T. Kearney, “Technology and Innovation for the Future of Production: Accelerating Value Creation”, March 2017.



Optimising the entire value chain with smart monitoring
Critical deviations are promptly identified,
and maintenance requirements automatically determined.

- Modern condition monitoring is a significant factor in helping to increase system availability
- Energy efficiency and carbon footprints are optimised
- Valuable data is collated for servicing and plant maintenance
- All device data is visualised via the Rittal Smart Service portal
- Requirement-driven maintenance helps to cut servicing costs
- Complexity is reduced with standardised but scalable Rittal monitoring solutions

Smart monitoring: Transparency and seamless data management

PDU

CMC III

DCIM

No data centre or manufacturing operation can allow its value creation processes to stall or come to a standstill. To avoid downtime and safeguard availability, malfunctions must be identified promptly and interpreted intelligently with the ultimate aim of cutting costs through greater efficiency and permanently boosting productivity.

Level 1
IIoT sensors play a vital role, by providing comprehensive monitoring to enable problem-free operation of manufacturing machinery and equipment.

Level 2
Rittal offers a broad portfolio of monitoring options. These include PDU and LCP as well as the monitoring of IIoT-connected production systems and physical ambient conditions. The CMC III monitoring unit in the rack collates data from up to 32 sensors that monitor active components. The PLC processes this information in the production line and activates a simple alarm if necessary.

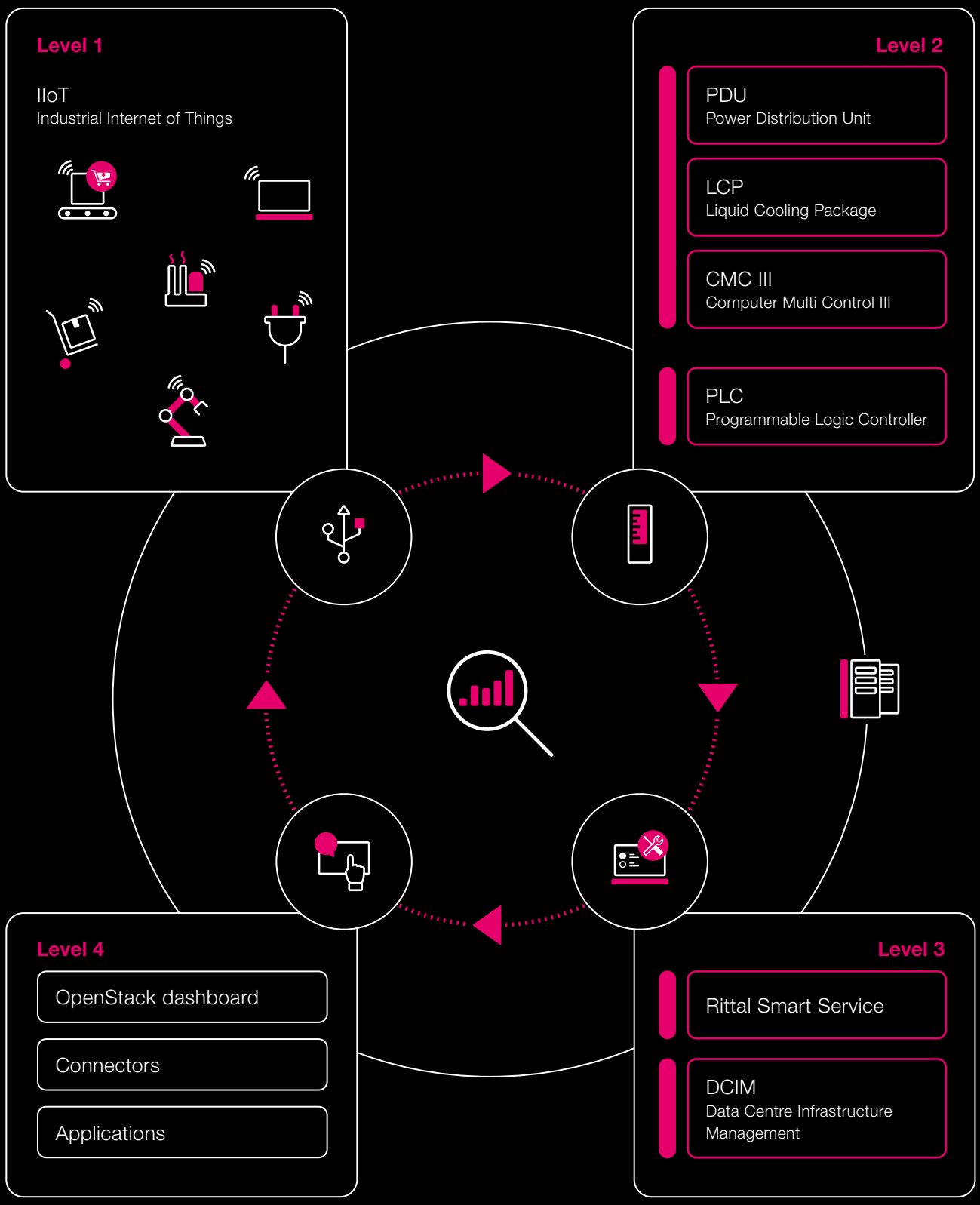
Level 3
All sensor data is forwarded to the DCIM (Data Center Infrastructure Management) or the Rittal Smart Service Portal. At this level, IT administrators and system managers can monitor the overall system status from the control room.

Predictive and prescriptive maintenance means that repair statuses can be anticipated, and corrective action initiated promptly and implemented autonomously. The continuous logging of error and maintenance messages enables optimised planning of servicing and repairs.

Level 4
As well as helping to cut costs, a summarised presentation of all relevant data in dashboards and applications extending through to management level opens up new potential for improved decision-making foundations, new value streams and customer-centric business models.

The findings are incorporated into production and the data centre in the form of optimisations and innovations. In this way, ongoing processes are automatically optimised using data-based smart maintenance workflows.

Monitoring topology



Reliable and trouble-free IT health: The WUND Group

When a company processes large volumes of data around-the-clock to ensure everything runs smoothly for its clients, any failures in the data centre IT systems are business-critical. Mindful of this, the WUND Group uses autonomous edge data centres and standardisation for its thermal spa facilities across Germany. Open 17 hours a day, 365 days a year, everything needs to run smoothly, from cashless payment through to irrigation of the palm trees. This is only made possible by a sophisticated, highly efficient IT infrastructure behind the scenes, coupled with continuous monitoring from Rittal.

Rittal's knowledgeable consultants gave us in-depth, expert advice. We were confident that they understood the challenges facing a thermal facility of this size, spread over multiple sites.

Franz Hofstetter,
Head of IT at the WUND Group

The Euskirchen spa, for example, has more than 3,000 separate IP addresses for pumps and control elements, including the automatic irrigation system for watering 500 palm trees. This generates vast quantities of data which must be processed and made available in the local data centre. The WUND Group needed a particularly high-end operating system to manage monitoring and error messaging across all its sites, while standardising the IT infrastructure as far as possible, and ensuring access to a supra-regional service network. Because minimal latencies are crucial for ensuring high availability in a 365-day operation, the WUND Group opted for a Rittal edge solution at each of its spas.

On site, the Rittal CMC III monitoring system uses sensors in the server racks to check whether everything is working correctly. That is, temperature, humidity, air speed and a host of other data is collated in the data centres. The analytics are consolidated and processed in a central unit. They are then incorporated into Rittal's RiZone data centre management solution via SNMP. This DCIM software is located in another data centre. From there, the data reported by the individual locations is continuously monitored, and alarms are triggered where necessary.

Industrial edge cloud with ONCITE: Rittal plant in Haiger

The all-in-one solution ONCITE

In Haiger, Rittal is operating a showcase project for Industry 4.0 manufacturing

The digitalisation of the process chain “from the customer to the customer” is being perfected at the world’s most cutting-edge production plant for small and compact enclosures. Rittal’s innovations help partners and customers to organise their own operations faster and more efficiently. Prices and availability of products are immediately visible, and once ordered, goods can be produced, delivered and assembled more quickly.

Rittal itself uses highly complex Industry 4.0 processes and knows, therefore, exactly the challenges facing the industry. Its own products are used in the monitoring and control of machines, equipment and systems. ONCITE by German Edge Cloud and Rittal, the first scalable, AI-based edge cloud data centre for real-time applications with guaranteed data sovereignty, logs, stores, processes and evaluates the data supplied by the machinery on site. This allows companies to decide for themselves whether and how processed data is transmitted to the various digital production platforms. New technologies such as industrial analytics and artificial intelligence also support industrial applications from Bosch Connected Industry, German Edge Cloud and IoTOS to help improve quality and optimise production costs and throughput rates.

Digital monitoring of processes at every stage in the value chain helps to safeguard quality and significantly boosts the plant’s overall efficiency. As an in-factory edge data centre, ONCITE supports the transformation to a smart factory and also adapts to various digital production platforms with complete data sovereignty. What’s more, ONCITE is fast and easy to use thanks to its “plug & produce” concept.

By 2022, more than

40%

of company cloud applications will use **edge computing.**[2]

2 IDC FutureScape, “Multiplied Innovation Takes Off, Powered by AI, Distributed Public Cloud, Microservices, Developer Population Explosion, Greater Specialization and Verticalization, and Scaling Trust”, 30 October 2018.


BINAR | QUICK-LIFT
SCHIERHOLZ
KUKA


FOD

Using flight simulations as safety tests: Airbus

An aircraft can't just pull over if there's a problem. Safety and reliability are absolute priorities for the aviation industry. Before an A320 can take off from the Airbus factory runway in Hamburg-Finkenwerder for the first time, it must pass a whole battery of tests and simulations of aircraft functions. Adequate cooling of the powerful simulation computers housed in enclosures and hardware is essential to prevent failures associated with overheating. As the hardware often caused problems in the past, particularly during the hot summer months, Airbus opted for cooling units from Rittal's Blue e+ range monitored via the IoT interface.

Powerful simulation computers

"Depending on the configuration, an A320 can undergo around 400 hours of testing", explains Volker Jacobs, Head of the Functional Testing department on the fourth A320 final assembly line.
All manoeuvres and operations arising during the flight and on the ground during day-to-day operation are checked here. All the functions needed to fly safely must operate with absolute reliability. Three computers which run the complex simulation programs are connected to the aircraft sensors and actuators via input and output modules. Cables as thick as a human arm run from the enclosure housing the hardware to the interior of the aircraft. It is possible, for example, to simulate engine revs or signals from the speed measurement devices. Outgoing signals are also logged by the computers. "All this hardware generates substantial heat during operation, and cooling is therefore vital," explains Jacobs.

Reliability is the number one priority

There are a total of 28 testing stations in the Airbus factory, all with similar equipment. Reliability is pivotal to all of them. "If the cooling of our simulation computers were to fail, we would not be able to carry out the tests," Jacobs adds. This is the only way to guarantee double-shift operation of the test rig on at least five days of the week. The function of the cooling units is continuously monitored. A warning light would alert personnel immediately if a cooling unit were to fail.

The status of all cooling units is reported to superordinate systems linked via an IoT interface. This enables prompt maintenance and ensures efficient operation by avoiding failures due to critical component breakdown and other external factors.

Volker Jacobs, Head of the Functional Testing department at Airbus

Rittal Smart Service: Maximum availability and top efficiency

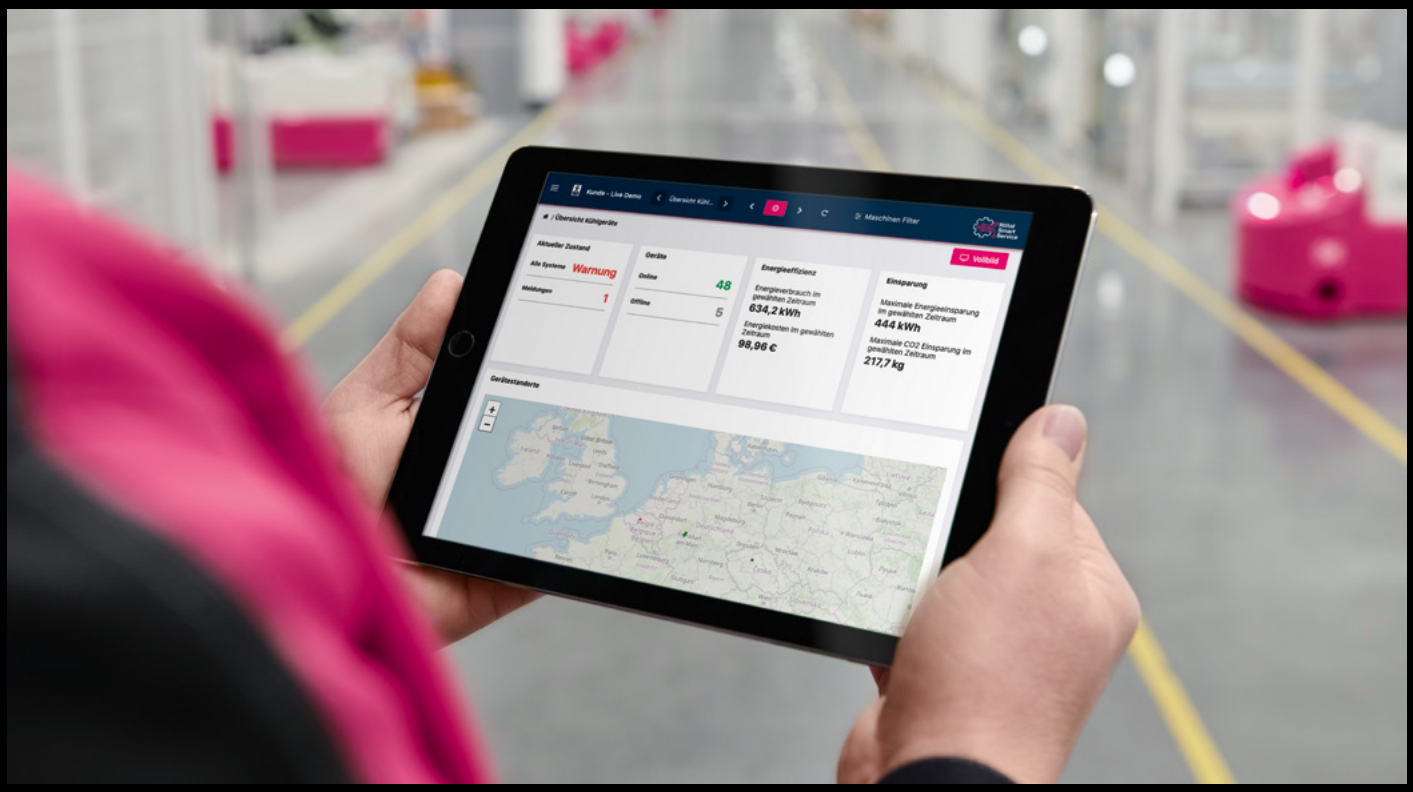
The **Rittal Service** works **24/7** for its **customers.**

Increasing system availability and optimising service processes
Rittal Smart Service keeps track of and monitors the operating behaviour of Blue e+ cooling devices. By transmitting data in real time, it ensures that maintenance requirements are determined and any anomalies are detected early on. The automated processing of device data permits fast and efficient troubleshooting.

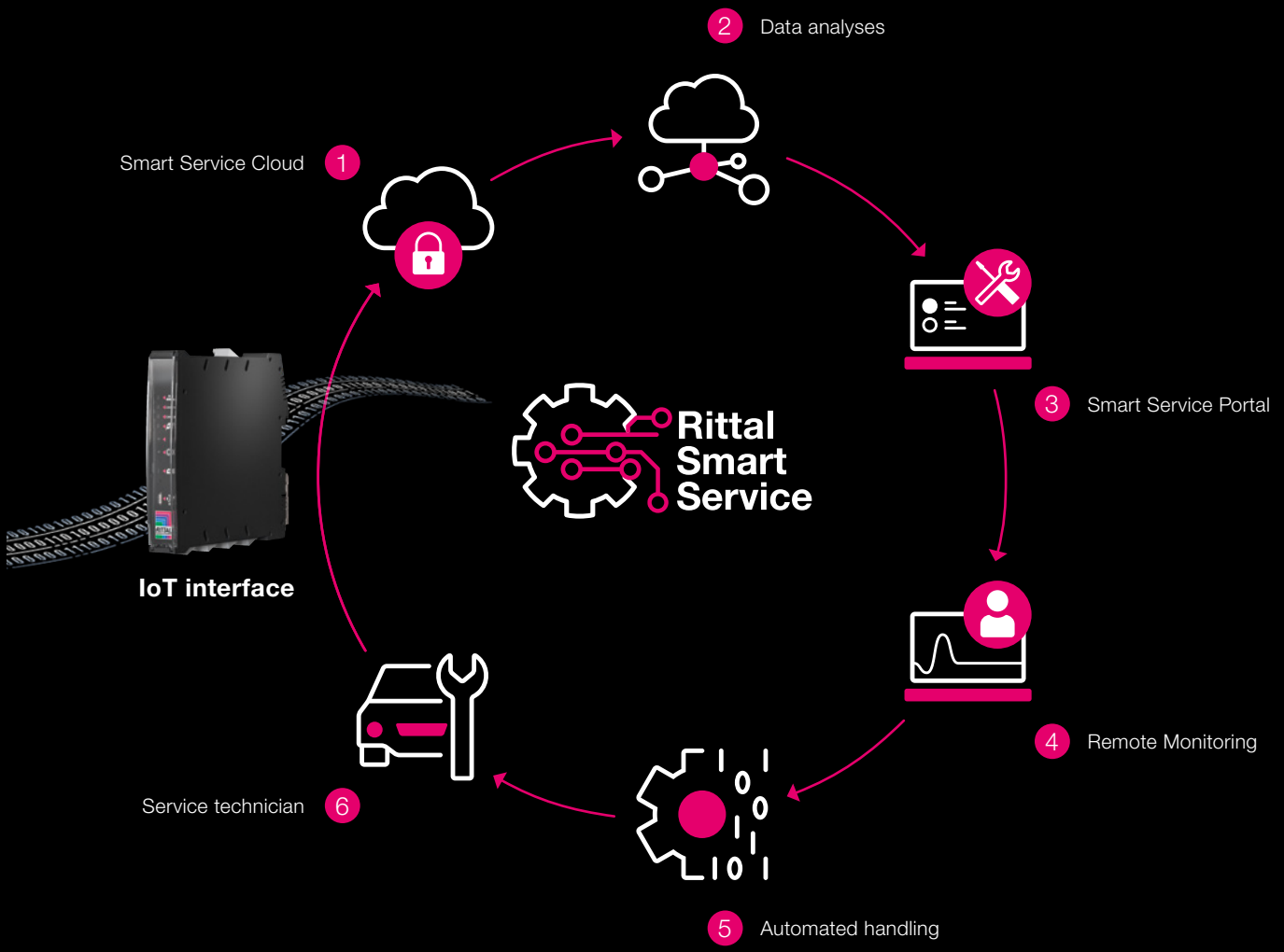
In the event of a malfunction, you receive situation-specific recommendations and energy efficiency analyses via the Rittal Smart Service portal. You also benefit from remote diagnosis and advice from the Rittal service experts.

The availability and analysis of the device data forms the basis for the predictive maintenance of the Rittal components. The forecast of the remaining service life of components supports the predictive detection of essential maintenance, so that maintenance can be carried out cost-efficiently as and when needed.

Professionally conducted service work ensures that the machines and technical systems function properly.



Rittal Smart Service



Your advantages

- Control of maintenance measures
- Visual presentation of data via the Web portal (condition monitoring)
- Access to operating and temperature characteristics
- Overview of energy consumption and efficiency analyses
- Situation-based recommendations for action with manufacturer expertise

Your benefits

- Enhanced system availability
- Increased service efficiency through on-demand maintenance
- Fast problem analysis and troubleshooting with remote diagnosis

Security through intelligence

As leading innovators, we are passionate about continuously improving our security solutions. In this way, we actively support our customers on their journey towards powerful value creation processes.

Uwe Scharf, Managing Director Business Units and Marketing, Rittal GmbH & Co. KG

Rittal IT security: For uninterrupted production operations
Your company can benefit from exceptional fail-safeness, maximum energy efficiency and significant cost savings using IIoT solutions and smart services. IT security, i.e. protection against cyber threats and physical risks, is a particularly vital consideration here. The potential for failures can be significantly reduced by installing a digital security management system based on event-driven, automated processes.

Rittal offers effective protection measures and monitoring solutions to keep your systems functional at all times. These include the powerful monitoring system Computer Multi Control III (CMC III) and the Data Center Infrastructure Management (DCIM) software. Using sensors to measure humidity, temperature, differential pressure and vandalism, they monitor and control the entire physical IT infrastructure of your data centre.

You can also protect the entire system against remote third-party access by installing access controls using dual-factor authentication and smart handle systems. Prescribed penetration and resistance tests plus corresponding certification provide information about the security standard of the solution used.

39 %

of companies are at a high or very high **risk** of damage from a **cyber attack.** [3]

3 Bitkom Research, “IT-Sicherheit im Rahmen der Digitalisierung”, April 2018.

Optimum cooling across all components

Optimisation of cooling output and energy balance with system-wide control

System-wide control refers to the optimum, consumption-based control of all components involved in the cooling process (generation, transportation and distribution of cooling). The control variable is the electrical power consumption of the overall system, which should be minimised in the interests of energy efficiency.

The cooling circuit with a Rittal Liquid Cooling Package (LCP) and external IT chillers (refrigeration units) operates according to a fairly simple principle: Cooling is generated, transported into the data centre, and selectively distributed among the individual components. Dissipated heat is absorbed and routed out of the data centre. A smart control system regulates the IT infrastructure according to the server load, to minimise the amount of energy needed to remove the heat.

This ensures optimum energy efficiency and helps to cut costs in several ways, including government subsidies and grants to reduce the pay-back period of a new system.

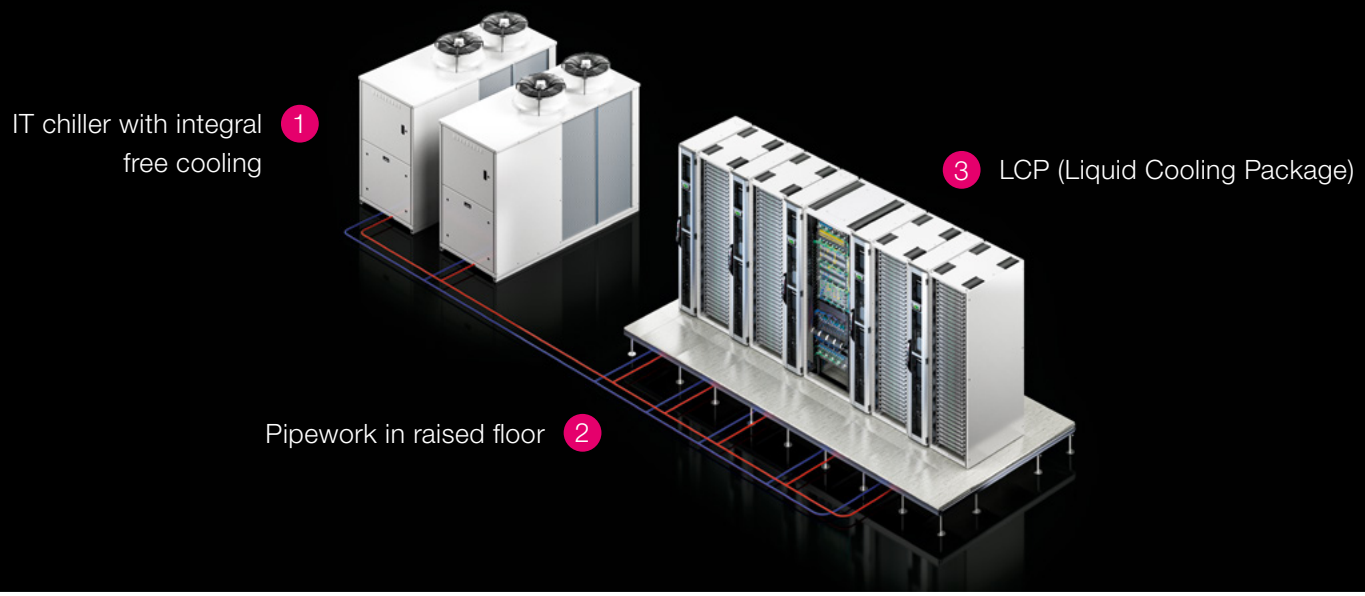
Average

75%

energy savings

with Rittal Blue e+ IT cooling units

Diagram showing system-wide control



Smart monitoring driven by sustainability

The digitisation of all economic sectors and areas of life has created a need for data centres offering maximum efficiency and reliability in terms of both procurement and operation.

Dr Karl-Ulrich Köhler,
CEO of Rittal International

A vital contribution towards protecting the environment
Because data centres contribute to the increase in global CO_2 emissions, efficient operation and sustainable handling of natural resources is essential.

The Lefdal Mine Datacenter (LMD) in Norway is the only project of its kind in the world. The data centre, housed in a decommissioned mine, sets new standards for the entire industry. Rittal was selected as a strategic and technological partner to supply the preconfigured, modular and scalable IT infrastructure complete with power distribution, climate control and software for monitoring and IT infrastructure management.

Located on the country's west coast, the 120,000 square metre data centre is powered solely by renewable energy. It is also cooled using water from the nearby fjord. Energy costs are low and the system achieves a PUE (Power Usage Effectiveness) rating of less than 1.15.

As a strategic technology partner to the Lefdal Mine Datacenter, Rittal is setting new standards.

PUE is a technical parameter which indicates a data centre's energy efficiency. "The Green Grid", an international consortium dedicated to improving the resource efficiency of data centres, explains that the PUE rating relates the overall energy consumed by a data centre to the energy consumption of the IT infrastructure. A rating of 1.15 means that just 10–15% of the energy consumption is being used inefficiently. Conventional data centres generally have a PUE rating of 1.9 – in other words, almost half of the total energy consumption is used for something other than its intended purpose, i.e. computing power.

Optional monitoring at all levels

Comprehensive logging of all data provides the basis for transparent cost monitoring. As well as calculating the current efficiency and annual average value, it also represents energy consumption in the form of kWh or euro (€). The client's management team receives all the figures needed for controlling purposes, from which they can derive planning and comparison calculations as well as other business-relevant statistics in order to determine the optimum operating status.

Smart monitoring, together with the use of modern cooling units and innovative concepts such as system-wide control, create a solid basis for efficient operation and the sustainable use of resources. It is clear that IT landscapes should not be considered in isolation but always within the context of a complete system. Monitoring and climate control solutions from Rittal can help companies to capitalize on major savings potential in terms of both their costs and their carbon footprint.

The LMD is around

40 %

cheaper than other data centres in **Europe.**

Rittal – The System.

Faster – better – everywhere.

- Enclosures
- Power Distribution
- Climate Control
- IT Infrastructure
- Software & Services

You can find the contact details of all
Rittal companies throughout the world here.

www.rittal.com/contact

XWW00213EN2004

ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL | IT INFRASTRUCTURE | SOFTWARE & SERVICES

FRIEDHELM LOH GROUP