DATA CENTER
INSIGHTS

Edition 4

CREATING INTELLIGENT DATA CENTERS

L1 legrand®

COLOPHON

CONTENTS

Improving lives
means creating a more sustainable world for everybody

It is our responsibility to provide concrete answers to the major societal challenges of our time, and this requires us to raise awareness not only in our own teams but also among our partners and customers. We need to bring them on board by our side as responsible players acting hand in hand with us. Our commitment to a low-carbon society is matched by our determination to guarantee a better future for our children and generations yet to come. This is why Legrand, leveraging the progress achieved in the framework of its previous roadmaps, now undertakes to intensify yet further its action in favour of an increasingly responsible development of its activities. This ambition is built around a simple and hopeful purpose: IMPROVING LIVES.

OUR 4 MAIN AREAS OF ACTION TO IMPROVE LIVES

Legrand has laid out its CSR commitments in four main areas, which bring together the most tangible challenges for the Group and its stakeholders

Promote diversity and inclusion

For Legrand, diversity and inclusion are a source of sustainable performance and prosperity.

Reduce our carbon footprint

It is urgent to reduce the Group's carbon footprint in order to fight climate change.

Develop a circular economy

Integrating a circular economy approach into Legrand's activities is a major component of the Group's sustainable development.

Be a responsible business

Acting responsibly means respecting and supporting all stakeholders, including employees and customers.

> Legrand takes concrete action to show its commitment to increasingly responsible development.

2030 TARGET

- Reduce carbon emissions related to our own activities by 50% and carbon emissions in our value chain by 15%.

- Achieve 80% of our sales with eco-responsible solutions

2050 TARGET

- Legrand has set itself the goal of reaching carbon neutrality throughout the Group's value chain.

Read more about our CSR strategy online:

GEIGER becomes part of the Legrand family

Geiger has become part of the Legrand Group! With its 25-year success story, Geiger can support customers in scalable and highly available communication and data center infrastructure – from idea to implementation. Geiger is the competence center for fiber optics and copper communication cabling, a partner for complete solutions in the data center sector and a leading specialist in management and monitoring solutions. Geiger's range of solutions highly complement and support the Legrand Data Center Solutions Europe product portfolio. ■

MORE INFORMATION
www.geiger-solutions.com

LEGRAND joins Spain DC as a main partner

Legrand joins Spain DC, the Spanish Data Center Association, as a Main Partner. The programme, limited to four members, is the closest form of collaboration with partners and the association itself and is designed to actively promote interaction between data centers, suppliers, and other players in the sector, to support the growth of the industry and accelerate the digital transformation of Spain.. ■

MORE INFORMATION
www.spaindc.com

NEWS

Introducing NEXPAND brand new coolers

Legrand identified two key factors that must be addressed to improve the energy efficiency of a data center: higher heat densities per cabinet and air leakage/recirculations. In this article, we highlight these two challenges.

CHALLENGES

The first challenge is that the growing trend of higher heat densities per cabinet is resulting in higher energy consumption of the equipment installed in the cabinets. The second challenge is minimizing air leakages and air recirculation, which are significantly impacted when combining coolers with cabinets that lack a smooth integration.

THE SOLUTION

The Nexpand platform solves these challenges; the platform provides customers with the most energy-efficient data center possible! How? The Nexpand platform was developed to provide the best-in-class airflow management solution.

RESULTS

Nexpand brand new coolers have been developed to be installed in the same frame as the Nexpand cabinets. Now a new portfolio of coolers is available and ready to work with the higher demands of the market and capable of benefiting from the vast portfolio of accessories that the Nexpand platform offers. Thanks to the seamless design and integration of the cooling solution within the same frame package, all the airflow management accessories (that ensure no air leakage between cabinets) can also be used between cabinets and coolers. The same goes for the bottom frame and floor. The coolers can also provide continuity and isolation to the cabling solution that normally runs on top of the cabinets.

Coolers are no longer simply devices that actively remove heat; with Nexpand they are also passively operating to deliver the best airflow management solution that the market offers! ■

Portfolio:
DX10kW, DX20kW, CW40kW, CW60kW.
DX = Direct Expansion ; CW = Chilled Water

MORE INFORMATION
www.minkels.com/solutions/cooling

DX COOLING VERSUS CW COOLING
Making the right cooling system selection is dependent on the customer's heat removal requirements. The expected heat density per rack, how many racks will have to be cooled, and the total length of the aisle, will define the correct cooling solution to apply. One DX cooler can deal with 10 or 20 kW of heat load, whereas CW cooling solutions can work for heat densities of 40 or 60 kW each unit.

LEGRAND strengthens its data center solutions offering with the acquisition of USYSTEMS

Company's latest investment opens up new high performance computing (HPC) and micro data center market opportunities; continues best of breed technology portfolio expansion.

USystems

Legrand has acquired UK-based data center infrastructure technology specialist USystems. The acquisition adds USystems' world-leading ColdLogik cooling technology to Legrand's solutions portfolio, alongside a range of micro data centers. Additionally, Legrand gains a significant, established presence in one of the key global data center markets. Add in USystems's sustainability credentials, and it's not difficult to understand why Legrand has made such a strategic acquisition which complements perfectly the company's existing, extensive data center infrastructure expertise.

THREE MAJOR OPPORTUNITIES

The HPC data center sector is expanding rapidly. Fuelled by the hyperscale data center providers' business model, the increasing focus on both large-scale data analytics and AI-based projects across all industries, and significant expansion of traditional supercomputing markets, this HPC 'explosion' places new demands on data center infrastructure – not least cooling.

USystems' range of retrofittable or new build ColdLogik Rear Door Coolers provides an efficient, sustainable cooling range from 0.1 to 200kW plus per rack. This makes these cooling units more than a match for the highest density compute/data center environments, with a whole host of benefits. These include: average 15% reclaimed power for compute by comparison to traditional cooling; potential cooling PUE of 1.035; 3.5% ColdLogik power to cool 100% heat load vs 38% traditional methods; over 50,000 trees worth of carbon saved per 1mW ColdLogik deployment; higher water temperatures reduce the need for mechanical cooling.

Similarly exciting is the rapidly developing edge computing market. The advent of technologies such as 5G and IoT have been well documented as the major enablers of edge computing applications. With these technologies comes the requirement for fast, local compute, networking and storage resources. This IT infrastructure needs to be housed in local, flexible micro data centers (MDCs) which enable, rather than restrict, the required edge application speed and performance. Furthermore, MDCs have to be able to operate in a range of environments – everything from a traditional office environment, through to the harshest of industrial settings.
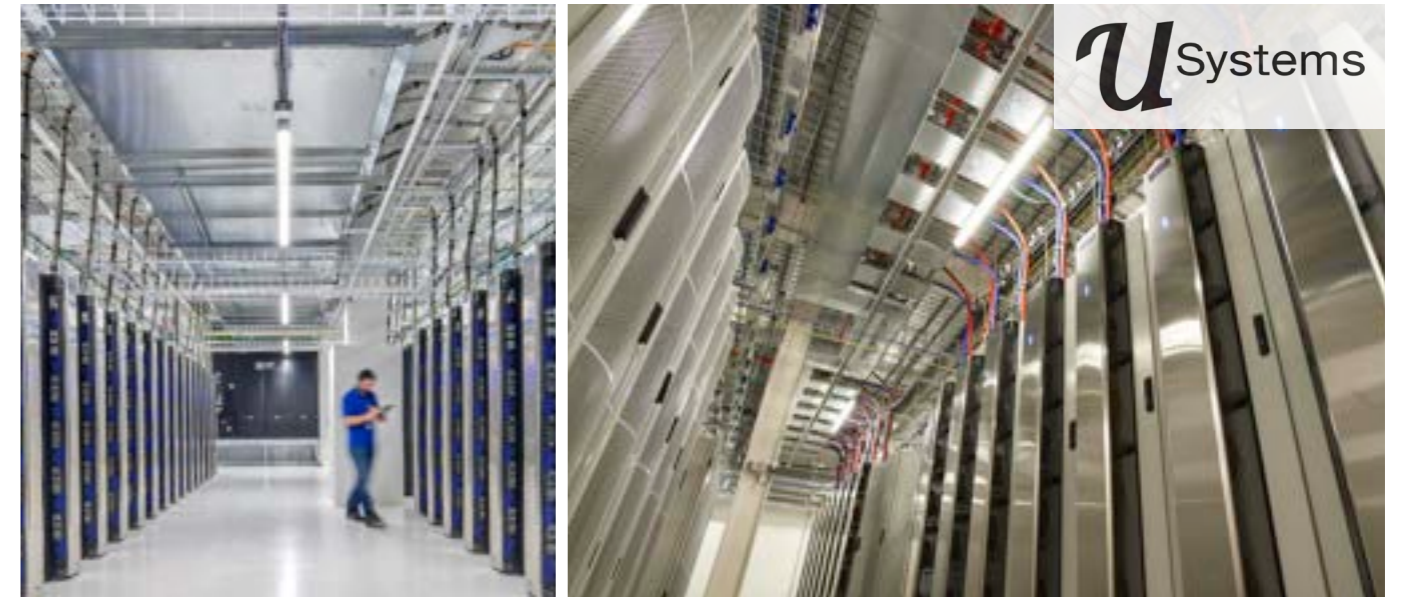
USystems has developed an MDC range designed using its award-winning, energy-saving Cold-Logik technology and, for most edge applications, occupying less than one square metre of floor space. The EDGE range includes air-cooled, LX and DX cooled MDCs and aisle containment PODs, with soundproof, side and rear door cooler options. Importantly, they are quick and easy to deploy.

In one recent customer application, USystems was given just a 15-minute window within a 24 hour period to install an MDC. Thanks to its pre-configured, integrated, plug and play solution, USystems was able to meet this strict requirement.

Alongside its HPC and edge data center innovations, USystems also offers ColdLogik inrow coolers and aisle containment and USpace racks and frames.

Legrand sees a significant opportunity for what might be described as 'two-way' market expansion, leveraging both USystems' technology portfolio and UK market presence. In simple terms, Legrand will be able to benefit from USystems' 15-year track record to sell more white space solutions into the UK; at the same time, helping to grow USystems' international business.

Pascal Stutz, CEO, Legrand UK & Ireland, explains why he is so excited by Legrand's most recent acquisition: "USystems allows us to strengthen our position in the fastest growing segments of the data center sector – HPC and MDCs; complements our existing offering in the data center white space market in both the UK and globally; and provides Legrand with additional expertise and capabilities in specialist cooling and energy efficiency technologies. All of which allows us to better serve customers' needs through value add, problem solving and an increasingly solutions-based approach to the markets we serve."

Scott Bailey, CEO, USystems Ltd, adds: "USystems' ColdLogik technology is in a prime position to support the data center industry's move towards a more sustainable, energy efficient future, as well as to meet HPC's higher cooling requirements easily. Our EDGE range of micro data centers complements Legrand's existing portfolio and fits with their philosophy of developing a more integrated, solutions-based approach to helping their customers, as opposed to simple product-based deployments. We are excited to join the Legrand Group and to expand the USystems portfolio internationally."

NEWS

Pascal Stutz, CEO at Legrand UK & Ireland and Scott Bailey, CEO at USystems Ltd

Connectivity that helps keep **BAVARIAN** citizens safe

Geiger successfully completes project with the Bavarian State Criminal Police Office (BLKA) to equip their redundant data centers with reliable, future-proof, scalable and highly available solutions to meet their current and future requirements.

CUSTOMER*CASE*

THE BLKA

The BLKA is the central IT authority of the Bavarian Police, with approximately 2,000 employees. It's not only the central office for data processing and transmission, but it also provides important services such as e-mail, and telephony converge. BLKA's data centers ensure these functions operate around the clock. Both the increasing demands on police work and the constantly changing IT and network processes require that the entire infrastructure must be reliable, future-proof, scalable, and highly available.

To equip the existing operational redundant data centers for future IT and network requirements in terms of technology, structure, availability, and reliability, the project "Restructuring DC-Whitespace" was started. Geiger supported the BLKA in this project over the entire process, from the initial idea, through to the conception and detailed planning, to the execution, including quality assurance and acceptance.

REQUIREMENTS

During several workshops, the requirements of the individual departments for racks, rack equipment, patch management in the racks, power distribution units (PDUs) as well as fiber optic and CU communication cabling were developed. Geiger analyzed the existing network topology, consolidated the requirements of the various stakeholders, and created an overall DC implementation concept named "Expansion Whitespace." This consisted of several expansion stages to ensure uninterrupted operation during the implementation. This concept was presented and approved ❯

BLKA selected Geiger as the contractor for this challenging data center project, as part of their procurement procedures. Geiger impressed BLKA with their positive customer references as well as their 25 years of practical experience in the areas of structured data center cabling and overall project planning. Geiger supported the project throughout all phases, from conception, planning, and implementation to completion. In close cooperation with the BLKA, a future-proof, reliable, and scalable cabling infrastructure (in accordance with EN 50600) was created for the data center.
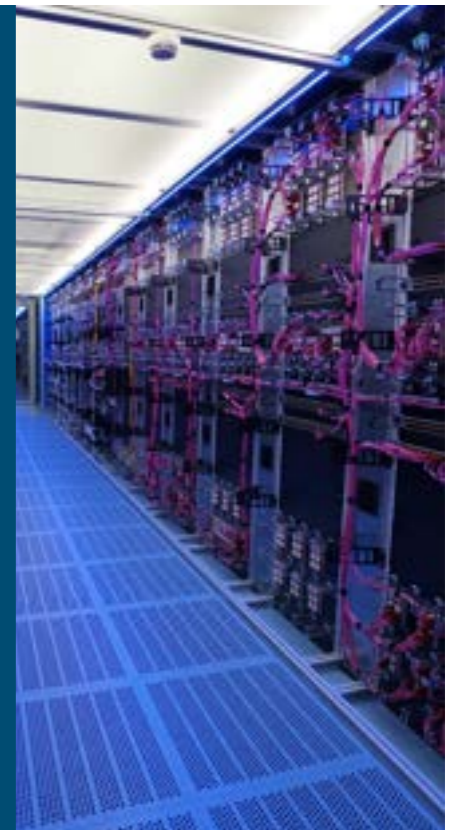
"At the beginning of our project, Geiger created a concept for a next-generation data center. In joint teamwork, with many discussions and discussion rounds, we were able to find a solution together that is future-proof and tailored to our needs. With innovative, but also proven technology, the data center of the Bavarian Police has been successfully rebuilt and can now meet the growing requirements of police work."

by the various departments. The final implementation concept comprised of a consistent and redundant, application-neutral, structured communication cabling in accordance with EN50600-4. The entire cable paths, main and area distributors, including the entire communication cabling, were built in physically separated A and B structures. In addition, important distribution nodes were additionally developed by a meshed fiber optic and CU cabling. The entire newly created technical equipment and infrastructure was designed and

dimensioned with expansion areas to allow flexibility to support growing requirements beyond the existing data center needs. This ensures maximum uptime, in addition to high availability and stability, is given and maintained over the service life.

REPLANNING EXISTING DATA CENTER

Based on the final data center implementation concept, a complete replanning of the existing data center areas was carried out. The new infrastructure had to be built in parallel with the existing

infrastructure. To make this possible, the new A and B main distribution areas were created in the first stage to accommodate the future passive and active technology and infrastructure. Geiger prepared all detailed plans and the execution, which included, among other things, DC area settlement including rack layout, cabling plans for the various cabling areas, rack settlement plans for the main area, and server racks, as well as route and label lists.

Due to the project being implemented during ongoing operations, the

installation could only take place in defined sub-project stages. This ensured that the work of the Bavarian police was not affected. In close cooperation with the BLKA departments and in coordination with the commissioned specialist installer, Geiger developed a phased schedule. After successful installation, partial acceptances were carried out for the individual sub-areas and then taken over by the BLKA into productive data center operation.

To create free space for the construction of the new infrastructure,

the hardware was moved to the new racks after the successful partial acceptances from the existing racks. Thus, the individual server rack rows could be rebuilt in stages. The original main distribution series was converted into a server rack series.

GOOD COOPERATION

Due to the good cooperation between the BLKA and Geiger throughout the entire project, the implementation went very smoothly. The objective of creating a reliable, future-proof, scalable and highly available data center was achieved, meeting all

requirement-specific expectations. The structured cabling that has been installed has been running flawlessly since commissioning. In Geiger, BLKA has found a local and experienced partner that can provide a leading portfolio of data center solutions and fiber optic and CU communication cabling. Following the completion of this project, Geiger is continuing to provide support to the BLKA on current and planned projects. ∎

As data center operators endeavour to push the boundaries of energy efficiency levels to reduce their carbon footprint and achieve a PUE ratio as near to 1.0 as possible, focus has turned to upgrading their most power-hungry equipment in the facility. After cooling equipment, old UPS systems using outdated technology are major contributors to compromising the optimum levels of efficiency.

Eamonn Sheridan, Data Center and Facilities Lead at Service Express

SERVICE EXPRESS
built and operates one of the most efficient data centers in the UK

CUSTOMERCASE

It is important to note that the current industry average PUE is 1.6, and older facilities are finding it more challenging to achieve this than new ones. Despite these challenges, Service Express, a well-established Tier III and Tier IV data center formed in 1987, prides itself on its green credentials and PUE ratio. By using suppliers who value their carbon reduction goal for their data center equipment, Service Express has been able to build and operate one of the most efficient data centers in the UK. Let's take a look at their journey!

SIGNIFICANT ENERGY EFFICIENCY GAINS
As the UK modular UPS partner, Power Control works closely with Legrand to deliver their innovative, three phase, modular UPS systems. Power Control has played an instrumental part in helping Service Express achieve significant energy efficiency gains by presenting a high efficiency, transformerless UPS (uninterruptible power supply) solution to replace its 10-year-old transformer-based UPS systems which required a major service and battery replacement.

TRANSFORMED-BASED VERSUS TRANSFORMER FREE UPS
Transformer-based UPS have their place, but due to their component structure are less efficient than transformer-free and modular technologies, therefore, maximising their efficiency is more challenging. Transformer-based UPS can also limit scalability and inherently lead to inefficiencies, in particular in 2N+1 configuration where the load is often not large enough. Loads within data centers fluctuate and this needs to be accounted for within any power protection strategy.

PUE
With UPS systems being a major contributor to PUE ratings, upgrading to new, more efficient technologies must be considered. Advances in transformerless, monolithic UPS technology not only give data center operators greater max KW output, thanks to their unity power factor, but they have also proven their resilience.

BORRI
Following a site survey and operational assessment, Power Control confidently presented the Borri Ingenio Max solution from the Legrand portfolio as a direct swap out for the legacy transformer-based units. "In total three 400kVA transformer-based UPS systems in a 2N+1 configuration, which were providing a maximum 640kW load due to their 89% efficiency have been
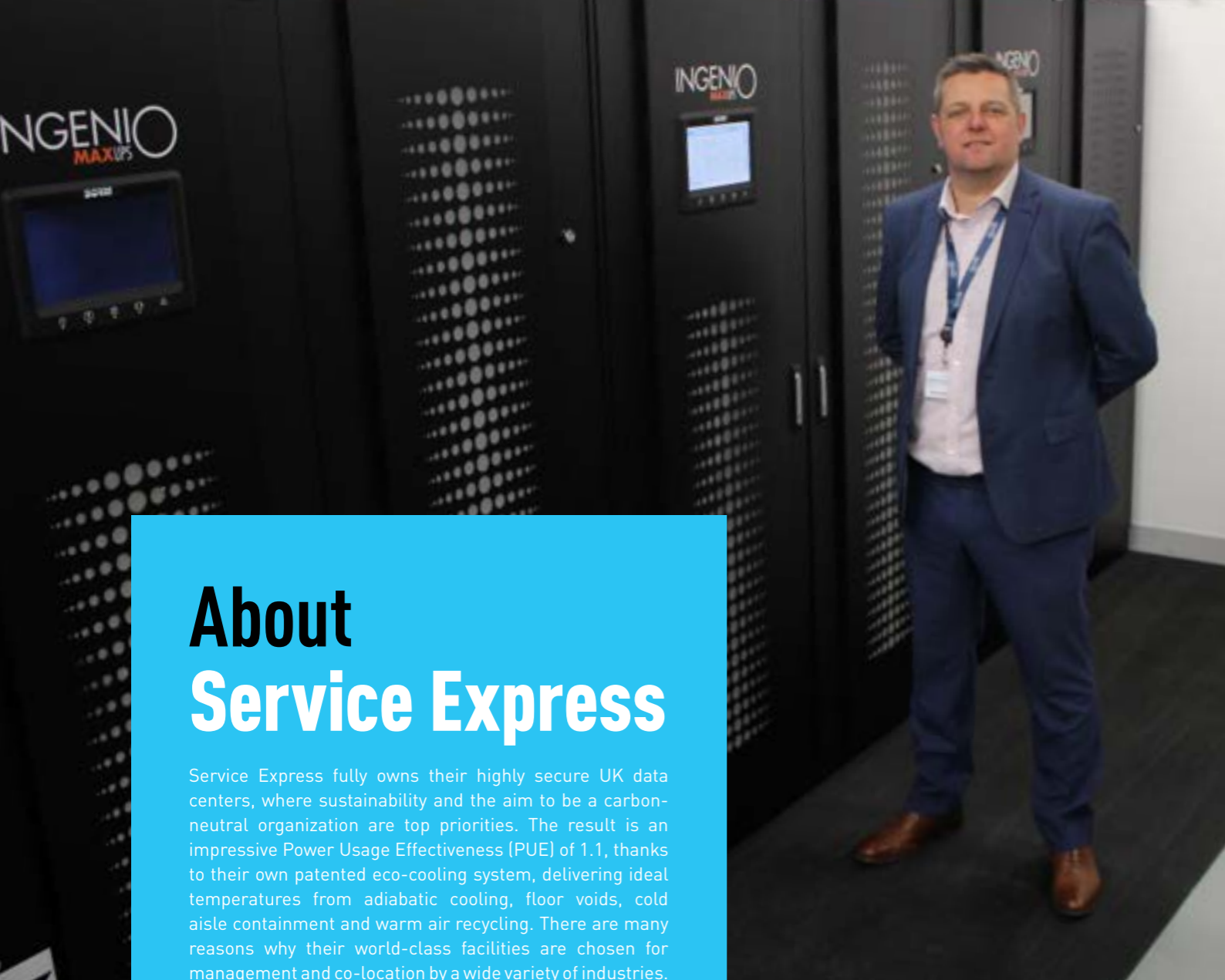

Rob Mather, Director of Power Control

About
Service Express

Service Express fully owns their highly secure UK data centers, where sustainability and the aim to be a carbon-neutral organization are top priorities. The result is an impressive Power Usage Effectiveness (PUE) of 1.1, thanks to their own patented eco-cooling system, delivering ideal temperatures from adiabatic cooling, floor voids, cold aisle containment and warm air recycling. There are many reasons why their world-class facilities are chosen for management and co-location by a wide variety of industries. One of those reasons being that they own and operate one of the few tier IV by design data centers in the UK.

replaced with three high efficiency 400kVA Borri Ingenio Max units in a 2N+1 configuration (the same as the previous) which provides up to 800kW maximum load due to the UPS unity power factor. Not only does this mean they are more efficient, but it also ensures optimal sizing", says Rob Mather, Director of Power Control. Power Control also presented the Borri Ingenio Max UPS system as the best solution because of Borri's Green Conversion technology, providing continuous savings, high efficiency and UPS component life extension for the customer.

MARKET LEADING PUE
"The direct swap out and upgrade has contributed to reducing the data centers PUE ratio to 1.1. Which is believed to be one of the lowest in the UK. This contributes to our overall goals of running one of the most energy efficient data centers in the UK. Thanks to Power Control's expertise, all preparation was done in the week leading

up to the swap out. Meaning that each parallel set of UPS, commission and changeover, was completed in a single day. Minimising any disruption for us", says Eamonn Sheridan, Data Center and Facilities Lead of Service Express.

ROI OF UNDER 5 YEARS
The new UPS installation also means Service Express benefits from an ROI of under 5 years and at current load levels, the efficiency savings for Service Express is approximately £20,000 per annum. The maximum efficiency of the Borri Ingenio Max is 96% so as the data center grows, and the load increases so will Service Express' annual savings. Service Express has also benefited from the space saving and lightweight advantages presented by transformerless technology, meaning their critical infrastructure takes up a smaller footprint in the facility. ■

CUSTOMER*CASE*

White paper
Data Center UPS - The essential characteristics of an optimized solution'

Data centers are the hidden core behind our daily "digital life". Downtime of a data center means huge money losses, reputational damage and even potentially dangerous situations. For this reason, in modern data centers, dedicated infrastructure is implemented in order to guarantee operational continuity and to provide high system resiliency - a UPS is one such essential infrastructure component. A suitable UPS must offer business continuity, limited TCO (Total Cost of Ownership) and adaptability.

Would you like to learn more?
DOWNLOAD OUR WHITE PAPER

Rediscovering
the value of remote management & monitoring

The COVID-19 lockdown forced organizations to rethink the way in which they conduct business and education, as they embraced remote work tools. This near-instantaneous shift in the working environment created new data center challenges for IT and data center managers as many were prevented from doing hands-on troubleshooting.

Because of their limited access to the physical IT infrastructure, network managers—more than ever—turned to remote network management and monitoring tools to help with rebooting servers and other devices, switching off unused outlets so that new devices could not be installed without their knowledge as well as gathering general data.

Although data center footprints did not increase much during 2020 (Gartner says there was a 10% spending decline in 2020), many facilities did realize an exponential service demand, brought

on in part by an enormous number of remote workers using new applications. This placed a great deal of stress on IT management as many data centers were operating on reduced IT staff and HR mandates that prevented personnel from entering the facilities.

An Uptime Institute survey underscored this issue when they asked over 200 critical IT/facility infrastructure operators around the world, "What is the number one risk that COVID-19 poses to your organization's critical IT infrastructure operations over the next 90 days?" An overwhelming 32 percent selected: Reduced level of IT infrastructure operations staff.

THE VALUE OF REMOTE MANAGEMENT

While being physically distant from their data centers, IT and data center managers also turned to power devices such as Switched PDUs, connected directly into the network, so they may manage devices remotely. Some of the most valuable features these Switched PDUs provided was the ability to remotely command and control functions for power loads, such as:

- **REMOTE REBOOTING AND POWER-UP SEQUENCING.** Rebooting isn't always easy - especially for multi-site data centers or colocation facilities. Rebooting can be performed remotely from a web interface, eliminating the need to deploy service technicians.
- **SCHEDULING POWER LOADS.** It's an undeniable fact that data centers waste power by running servers that actually are doing nothing. A Switched PDU offers the ability to remotely manage a power schedule on a per-outlet / device basis.
- **LOCKING OUT AVAILABLE OUTLETS.** Sometimes the rack is out of power or the phases need to be rebalanced. Using a Switched PDU provides the ability to change an outlet from a "power off" mode to a "power on" state, which is important for managing the critical load and ensuring uptime.

THE VALUE OF ENVIRONMENTAL MONITORING

Needless to say, it's difficult to remotely manage a data center if you don't have visibility into its environment and associated elements. And visual modeling tools that are static and work in silo mode have little integration with other critical tools such as Data Center Infrastructure Monitoring (DCIM). This often forces managers to comb through CAD drawings to pinpoint faulty devices. However, over the course of the pandemic, data center managers began a deeper dive into devices and tools that give an enormous amount of visibility into operations.

Among the devices used in data centers, environmental monitoring sensors play a big role. Like the proverbial miner's canary, environmental sensors have been helping IT and data center professionals by monitoring the health around cabinets and providing alerts into potential problems that can jeopardize the performance and life of IT assets. Data centers of all types (edge, core, and colo) rely on smart sensor tools that provide accurate insights into the environmental health in and around IT equipment racks.

Today, much of the IT equipment has been optimized to detect and report on adverse operating conditions so managers can quickly take action—even remotely from home—before a costly issue arises. Additionally, smart sensors assist IT and data center professionals by:

1. Preventing overcooling, undercooling, electrostatic discharge, corrosion, and short circuits.
2. Reducing operational costs, deferring capital expenditures, improving uptime, and increasing capacity for future growth.
3. Providing environmental monitoring and alerting managers to potential problems like the presence of water, smoke, and open cabinet doors.
4. Saving up to four percent in energy costs for every degree of upward change in the baseline temperature a.k.a, a set point.
5. Helping to populate AI (Artificial Intelligence), ML (Machine Learning), and other future initiatives.
6. Providing valuable information for a multi-dimensional view of distributed data center operations.

**A DATA-FED DASHBOARD THAT REALLY MATTERS**

Most data centers operate using some type of Network Operations Center (NOC) dashboard that aggregates information across multiple sources, but this can sometimes lead to inaccuracies. If the data is not trustworthy, the decisions will be flawed, and if the decisions are flawed—a trip to the rack is necessary to verify the information. Obtaining accurate information is not rocket science and can be automatically gathered by smart sensors and intelligent PDUs at the device level, to provide those trustworthy environmental insights.

Data that really matters will yield reliable operational insights, and if it's displayed in a user-friendly format, managers will engage with it. Data Center Information Management (DCIM) solutions offer that easy interaction by taking the rich, live measurement data and combining it with detailed asset management, including full power-chain connectivity configurability. It does not matter if a COVID lockdown is in effect or not, using 3D dashboards, data center managers can see the environmental conditions of their facilities from a remote location—better than actually being on-site. Aggregated data fed into DCIM dashboards allow IT and data center managers to view the server racks and pathways into cabinets as well as easily drill down to isolate a single cabinet to get a view of all the compute devices including the name, make, and status.

KNOWLEDGE
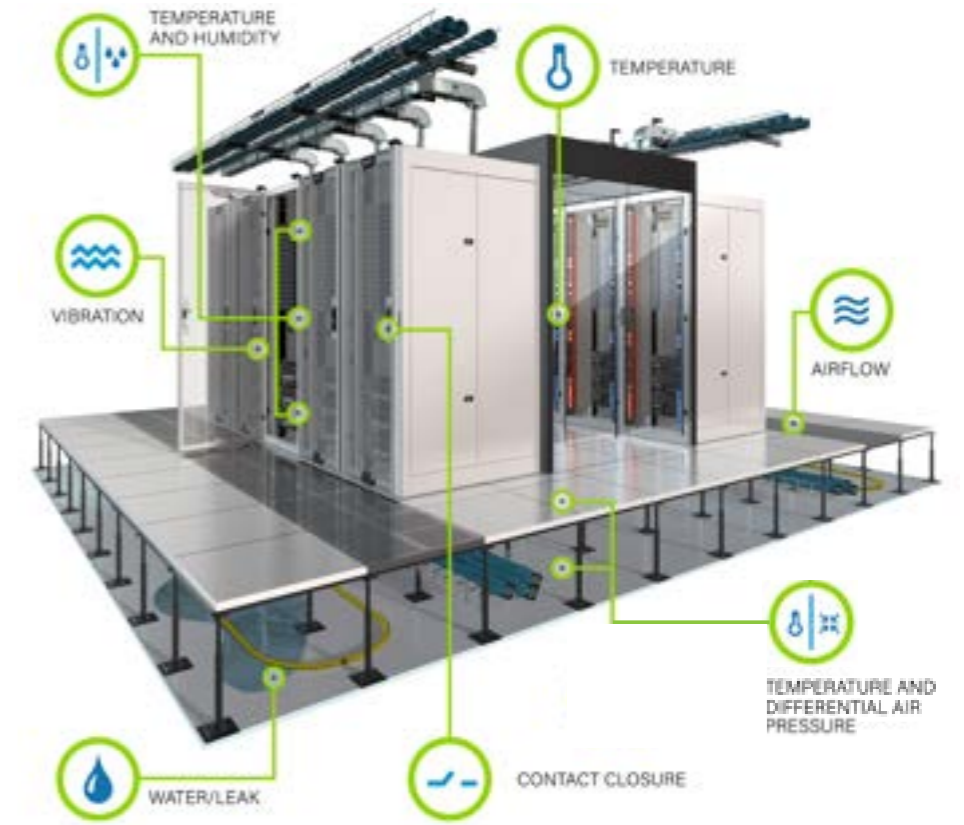
But it does not stop at the rack level, the visibility extends above the cabinets for a deep dive into tap-off box critical power monitoring, which may be used as part of a Track Busway system or as a standalone solution. A simple double click on a tap-off box from the 3D dashboard will reveal a live feed of watts, amps, volts, or kilowatts. All this detailed information is kept in a model library to eliminate redundant data input and includes: which protocols are enabled on new units; DCIM integration information, and load balancing data.

Remote monitoring data taken from PDUs gives a DCIM dashboard the ability to display how power resources are performing and what they are consuming at the rack level. With this type of insight, IT and data center managers can better plan for capacity changes. In addition, with the data feed from PDUs and sensors, they can also receive an at-a-glance view of:
• Cabinet temperatures.
• Abnormal amps on intelligent rack-mount PDUs or busway tap-off boxes.
• Humidity fluctuations.

A good rule-of-thumb is to always look for intelligent PDUs that are able to integrate with all BMS, DCIM, or other tools such as Splunk or Tableau. ■

CONCLUSION

If there ever was a time for data center and IT managers to embrace their remote management and monitoring tools it was at the onset of the pandemic. Even now as vaccinations are quelling the spread of COVID-19, a large percentage of workers will still remain, or partially remain remote. In a recent Gartner poll, 90% of HR leaders said employees would be allowed to work remotely even once COVID-19 vaccines are widely available and yes, this includes IT professionals.

Far into the foreseeable future, data centers will continue providing high-demand services. But in order to meet demand, those who manage these mission-critical services must also embrace the tools to enable an ever-growing remote workforce to constantly monitor thresholds, predict capacity utilization, set the voltage traps, and balance the data center's environmental conditions. Deploying intelligent sensors, sensor management, PDUs, tap-off boxes, and a DCIM solution to bring a 3D dashboard to life, will empower remote workers to conduct their jobs—often faster than walking the server isles or power path to make hands-on assessments.

Legrand is a key supplier for
MOVE-IT TECHNOLOGY'S
migration service

More and more companies are migrating parts of their IT infrastructure or even their entire on-premise data center to a colocation facility, complete with extensive, high speed connectivity options, enabling them to directly access Cloud platforms with minimal latency. Move-IT Technology provides such a professional migration service in Southern Germany, relying on key infrastructure suppliers such as Legrand.

CUSTOMER CASE

To help minimise downtime for either staff or business partners, it's important to engage an IT equipment relocation expert, who can coordinate the migration planning and implementation (dismantling, transport and set-up) process. This ensures that the new, relocated infrastructure is operational as and when expected. Additionally, the infrastructure that's no longer required will be dismantled and disposed of securely and correctly. Perhaps most importantly, the managed migration should mean that the IT infrastructure at the new location is based on the latest technology, providing significant future-proofing 'protection'. This should mean that the performance and capacity of data throughput - based on compute, storage and networking infrastructure – meets not just immediate requirements, but also anticipated expansion and new applications.

RELOCATION WITH PROFESSIONAL SUPPORT

A complete data center move is a logistical challenge that should be planned in detail in advance and then professionally implemented on the relocation date – even if much of the existing IT infrastructure is being replaced by new hardware. Obtaining the support of an IT relocation specialist is essential. For example, the data center service provider Move-IT Technology has a 10 year history of moving IT equipment for a variety of clients - the company has several branches in southern Germany.

After an initial visit, Move-IT Technology's data center experts establish all the details

> "With Legrand as a partner, Move-IT Technology has numerous innovative, space and energy-saving components available from a single source for the data center conversion."

for the move with the client's project leaders. Subsequently, they produce a detailed dismantling plan for the existing data center and a relocation and installation plan for the new one, including a timetable. In the planning, the project team decides which components should be moved to the new premises and which should be disposed of. The new infrastructure with the new and existing components is planned together with the client. In the selection and purchase of the new equipment, the relocation specialist provides support and ensures that this is ready on time in the new premises on the move date. As a rule, even a complete data center move takes place in one weekend.

DISMANTLING OF THE EXISTING DATA CENTER
If the entire data center is relocating, Move-IT Technology starts dismantling the existing data center on a Friday afternoon, with the electricians first disconnecting the electricity and water supply and switching off the heating, air conditioning and fire protection system and disconnecting them from the grid. In the next step, the security technology is dismantled. The team also removes the hardware components that are to be reused and labels them so as to permit quicker, trouble-free reassembly at the new site.

The installers produce a cable removal plan for the associated cabling and this cable management expertise ensures that, after the move, the right cables are connected to the right components.

In the next stage, all the server racks, IT cabinets and power distribution units (PDUs) are dismantled and removed, as well as the cameras, transformers, decentralised cooling units, cable trays and the like. The IT professionals pack the servers and other delicate IT equipment securely and place them in special EDP shipment trays.

If hard disks are to be disposed of, the data center experts first delete their contents and then destroy them so that there is no longer any possibility of any data remaining on them. In terms of the UPSs, they remove the batteries and transport and dispose of them separately. The extinguishing medium from the fire protection system and the gas and coolants from the pipes supplying the air conditioning are pumped out and also correctly disposed of.

Then the fire protection and sprinkler systems and the entire air conditioning system can be removed. This is followed by the ventilation system, the cable seal sheathing and the lighting. Then the dismantling experts remove the walls of the cells, the false ceiling and the raised floor together with the associated support structure. They remove the remaining cabling in the cells and the anteroom, dismantle the metal floor in the cells and correctly dispose of all components that will no longer be needed at the

new site. The hardware to be reused is taken to the new site with transport insurance. The client acquires clean-swept premises upon handover.

THE NEW IT: LAID OUT FOR NEW AND INNOVATIVE APPLICATIONS
At the new site, a Move-IT Technology assembly team is already busy assembling the IT racks and cages and laying the cable trays and the raised floor. The technical equipment is installed as per the client's wishes. The company has a reliable pool of suppliers so as to guarantee a trouble-free process.

One of Move-IT's key suppliers is Legrand, as it is the only company that can supply the crucial components for the grey and white spaces from a single source, including brands such as Raritan, Minkels and Server Technology. Move-IT can use Modulan cages, Minkels IT racks and support structures and cable trays from Legrand as required.

ENERGY EFFICIENCY
In the grey space with the power distribution, it is crucial that the solutions employed operate in an energy efficient manner and occupy minimal

space. Here, modern bus bars from Starline and Zucchini are used, as they do not disturb the airflow in the sub-floor and measuring points can be installed in a flexible way to monitor consumption data. The UPS used should – if possible – not only demonstrate high efficiency but also modular adaptability for the required performance. For example, Legrand's Keor MOD series is a very compact modular UPS which achieves an extraordinarily high efficiency of 96.8% with double conversion. This may be expanded to 250 kVA and remotely controlled and requires less than one square meter of floor space, even with the door open. The series also includes UPSs up to 500 kVA.

Legrand also offers energy-efficient active systems for series-based cooling. This eliminates the need for a raised floor.

With the cooling in particular, optimized channelling of the airflow in the (Minkels) IT cabinets is possible via (Modulan) hot or cold aisle containment and major savings in energy and cooling requirements can be made with such energy-efficient components. If, for example, (Raritan) intelligent PDUs are used, components not in use can be switched off and remotely activated as required. Since, by using these PDUs, the consumption is measurable for every connection, the loads can be evenly distributed over the racks, additionally, any defects in equipment can be quickly detected.

RESIDUAL CURRENT MONITORING
Moreover, intelligent PDUs can constantly conduct residual current measurements in the 5-wire network. So, one may dispense with the stipulated regular insulation measurements that would be necessary with the use of earth leakage circuit breakers in conformity with standards (DIN EN 62020 and/or VDE 0663) and eliminate the associated interruption to operations.

ENVIRONMENTAL CONDITIONS
PDUs also provide the opportunity to connect sensors for temperature

and air humidity, in order to monitor environmental conditions. With the same controller, door locking, camera surveillance and monitoring of the integrated assets is also possible. The solution works with standard protocols such as SNMP and Modbus so it is easy to incorporate into a DCIM system. This system permits web-based configuration.

Both the PDUs with their attached sensors and the KVM over IP switches for remote access to servers are fully protected with standard-based security mechanisms, as is the case with the Legrand UPSs.

CABLING IN THE WHITE SPACE
A modern data center needs a modular, high-density cabling system in order to save as much expensive space as possible in the data center. Here, reserve bandwidth should be allowed for in the selection of the LWL or copper components. Today, pre-manufactured MPO-based solutions or LC duplex connectors are mostly used. If servers are to be connected via copper connectors, the planner should above all observe the gaps between the rows of racks - because with Category 8 (25 and 40 Gbit/s Ethernet) the distances including the patch cable are restricted to 30 meters. This means that one switches to direct attach switch server connectors in Top-of-Rack (ToR) configurations or the rows of racks are arranged in such a way that Middle-

of-Row (MoR) and End-of-Row (EoR) configurations are possible. Legrand cabling systems offer modular and maintenance-friendly, high-density solutions for both copper and LWL, even for the high-performance computing sector.

All these products are designed for efficient, optimized use in the data center, are compatible with each other and come from a single source. This simplifies the issue of responsibility when it comes to maintenance and service in operation.

TEST
Move-IT Technology prepares everything before the move, having installed, and documented, the cabling in advance. This means that the data center professionals can quickly install the transferred and new active components, servers and storage systems and complete the structured cabling, including the cable management. All ports and devices are labelled and documented. Once everything has been installed, the hardware is configured according to the client's wishes. Lastly, the experts inspect all the components again and if necessary change any defective systems after consultation with the client. In this way, the systems in the existing data center can be switched off on Friday evening and on Monday morning they are already tested and ready for use by the users in the new data center. ∎

If you can't stand the heat,
CALL FOR RARITAN!

The University of Southampton is midway through a programme of implementing Raritan PDU technology within its main data center and more than 200 multi-campus IT hub locations. The university's decision to standardize on Raritan technology follows on from issues experienced with its previous supplier's PDU technology and support.

"We offer an average of more than 350 different IT services to our user community, spread across the main Highfield campus, the Avenue arts, humanities and foreign languages campus, the oceanography and earth sciences dockside campus, the Winchester School of Art and Southampton University Hospital Trust."

Mike Powell, Data Center Manager University of Southampton

The University of Southampton has around 22,000 enrolled students, 5,000 staff, an annual turnover of in excess of £400 million and is a founding member of the Russell Group – an organization of 24 top UK universities dedicated to maintaining the highest research and teaching standards. Additionally, the university has upwards of 170,000 subscribers to its Massive Open Online Courses (MOOCs) - free study programmes designed to be studied online by large numbers of students. Course materials such as video lectures, reading material, course work and tests are augmented by forums which help students and tutors build an online community.

As with any modern educational environment, the university's IT infrastructure plays a crucial role in ensuring the smooth running of almost every aspect of campus life. Digital infrastructure underpins the university's research and innovation excellence (a major revenue resource), which relies on two supercomputers for much of its work, and the day to day activities of the students' learning (and social), academic teaching and support staff administration activities.

The major switch to online learning in response to coronavirus has served to put extra pressure on, and expectation of, the university's IT resources, the nerve center of which is the data center.

Data Center Manager Mike Powell explains: "We offer an average of more than 350 different IT services to our user community, spread across the main Highfield campus, the Avenue arts, humanities and foreign languages campus, the oceanography and earth sciences dockside campus, the Winchester School of Art and Southampton University Hospital Trust."

The university's Tier 2 data center went live in March 2013 and is currently configured for a day one load of 1.1MW. The facility's infrastructure has been provisioned to provide an easy, seamless, non-disruptive upgrade to a 2.5MW load as and when required. With another supercomputer on the horizon, some of this extra capacity is likely to be taken up in the next couple of years. That said, some of the day-to-day, commodity IT applications and workloads have already been moved to the cloud as part of a 'cloud first' strategy, so the data center is unlikely to experience any workload capacity issues any time soon.

The data center was designed with a smaller capacity and footprint than most, due to the university's early investment in an aggressive virtualization exercise (the initial plan for 40 racks was reduced to 12). Add in the two supercomputers

and it is fair to say that the data center is something of a trailblazer when it comes to high density operation.

The data center infrastructure has in-row 30KW chillers at its core, which offer excellent high density cooling opportunity characteristics and a high level of resilience with rack rows.

One of the challenges faced when operating high density rack loads is the power distribution unit (PDU) at the rear of the rack.

Back in 2013, when the data center went live, the PDUs chosen were seen to be best in class at that time. However, in the high temperatures generated by the facility's high density environment, some of these units were failing prematurely.

TEMPERATURES AROUND 45 DEGREES
Mike takes up the story: "Back in 2019, I had a chance meeting with a Raritan representative at a data center conference and the discussion was around why is the Raritan product better than what we had already. And it was around the fact that we were starting to see premature failures of the existing PDUs, due to heat we think. What we were seeing at the rear of the racks were temperatures getting around 45 degrees and that was too much for the existing product.

"Some of the features that Raritan portrayed to us were that the Raritan product could withstand 60 degrees and the fact that we could have hot swappable management consoles, which the previous product set didn't do; and that it used less power to operate its intelligent features – independent outlet control and independent power monitoring per outlet. We don't change brands lightly, so we had a sample product sent down for evaluation, we were very impressed with it and then we made that decision. We'd tried a number of other products and manufacturers, but it was the Raritan product we opted for, based on those three criteria initially. So we swapped and we've almost replaced all the PDUs in the data center, we're just waiting on the final supplies."

Additionally, Mike has undertaken a Raritan PDU replacement programme in the more than 200 data distribution, hub rooms. As he explains: "We now have one consistent product line across the estate – that's really important when we're interfacing with our management platform to see any overheats that are going on in the data center or in the hub rooms that we have one product set that we interface into, not numerous ones we have to try and connect to."

REFURBISHMENT PROGRAMME
Currently, the hub rooms are undergoing a refurbishment programme, to ensure that they all have the same infrastructure. Temperature sensors are fitted as standard. "One of the beauties of the Raritan is that you can plug a temperature sensor straight in," says Mike. "We also do leak detection in some of our major rooms for any of the air conditioners which may suffer leaks or

water ingress. And one of the reasons we chose Raritan was the connectivity opportunities on its management interface, with numerous different sensors that are plug and play."

Mike continues: "In the data center we use the intelligent PDUs, but in the hub rooms we use the metered PDUs, where we do need that control per outlet. So, we have a couple of different types that we tailor to the end use."

Other Legrand solutions are being implemented as part of the refurbishment work. The company's MIGHTY MO network frames are being used extensively across the hub rooms - where a conventional rack needs replacing - as are Cablofil steel wire cable trays. Additionally, EZ-PATH fire stopping devices are being installed in the hub rooms. As Mike details: "Basically, you install it into a hub room wall, a fire break, and you can keep putting new data cables through it. If and when there is a fire, the device seals up."

He adds: "These products, plus the PDUs, are listed in our specification not only for new builds, but also for refurbishing any of the existing university buildings, as our chosen product set for deployment. So, Legrand is in our data center, they are in our landing rooms and our core edge data distribution rooms already and in the specification for any new deployments." ∎

CUSTOMER CASE

White paper
'Smart cities run on smart power'

Do you want to explore the critical role Intelligent Power Distribution plays in making "smart" happen?

In smart cities, remotely managed power distribution provides a means of reducing power consumption, resetting disparate hardware systems, and providing localized environmental monitoring for both the control systems and the networking hardware that make a city "smart."

Would you like to learn more?
DOWNLOAD OUR WHITE PAPER

Improve & secure

your data & power cable network

As highlighted by the fire at the OVHcloud data center in Strasbourg in March 2021, one of the major concerns in data centers (as in many other mission-critical and industrial buildings) is fire protection – the protection of people, goods and data.
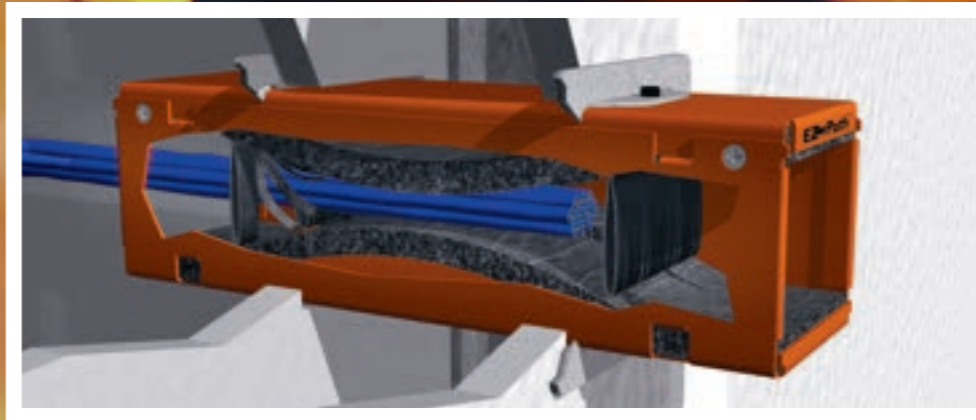
PROTECT YOURSELF FROM FIRE

The market offers detection solutions (detector/siren) to sound an alert in the event of fire, and also active protection (sprinklers / extinguishers). There are also compartmentalisation solutions . This passive protection limits the spread of fire and smoke in a building where the walls are penetrated by cables.

SCALABILITY OF INSTALLATION: A KEY POINT

Some projects neglect scalability and flexibility requirements and the wall penetrations are often just filled in with foam (fireproofing) or mortar/cement, which permanently fixes the installation.

Any change to the cabling infrastructure at this location will require demanding and potentially dangerous work and could undermine previous construction work.

To address this problem, there are fire-resistant cable ducts with an integrated sealing system that allow cables to be added or removed to ensure fire protection during the entire construction phase (even when empty) and during operation. Installing new cables with an (EZ-Path®) fire-resistant cable duct will not generate any dust that could damage your infrastructure and will help to maintain a clean and safe environment for servers. These fire-resistant cable ducts are perfectly compatible with and can be adapted to all cable tray widths of Cablofil® type using multiple solutions to ensure continuity of routing and to guarantee passive protection when penetrating walls (concrete, brick or breeze block walls as well as hollow or plasterboard partitions).

COST OPTIMIZATION

The use of firewall module systems (by caulking) allows you to create circuit separations and to manage your conductors (both high and low current cables), by type, client or application. Providing for this upstream eliminates any hidden costs

(additional costs of firestop maintenance – risk of firestop non-compliance – risk of cable damage – risk of power failure and loss of network), and means permanent compliance with passive fire protection. The only costs are the initial costs: the cost of purchasing the product and the cost of installation.

A FINAL WORD OF ADVICE

Without a firestop cable entry module, wall penetrations are often sealed with traditional sealants on and around your cables. If you add cables or make changes, you will have to drill again (dust), remove the sealant, block or firestop foam (waste), and then seal the whole thing again (fixed installation); this is no longer electrical work, it's masonry.

OUR ADVICE: DON'T LET JUST ANYONE TOUCH YOUR CABLES TO GUARANTEE AN EI120 INSTALLATION

In conclusion, only certain firestop cable trays (including EZ-PATH®) maintain smoke, sound and fire barriers at all times, while guaranteeing total integrity of your cables and offering the option of an upgrade without loss of service or functional limitations. ∎

PRODUCT *CASE*

Fire resistance rating	EZ-PATH® classification	
• Flameproofing: Criterium E – flameproofing performance • Thermal insulation: Criterium I – thermal insulation performance	Flameproofing (E) + thermal insulation	Flameproofing (E)
	EI 120 (120 minutes)	E 240 (240 minutes)
	Classification according to EN13501-2 standard	
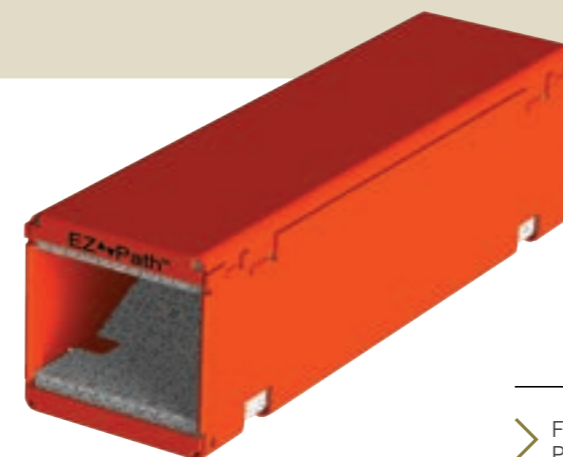
FOR MORE DETAILED INFORMATION
PLEASE DOWNLOAD THE BROCHURE.

EZ-PATH
FIRE STOPPING DEVICES

Recently, the construction of the new High Performance Computing Data Center of the University of Groningen (RUG) and the University Medical Center Groningen (UMCG) was completed by EQUANS (formerly known as ENGIE Services). This ultramodern and fully equipped data center was successfully accomplished through excellent collaboration with partners Legrand and VSK Kastenbouw.

CUSTOMER*CASE*

New ultramodern, fully-equipped data center for the

UNIVERSITY OF GRONINGEN (RUG)

Tony Masure, Business Development Manager UPS at Legrand

"Thanks to the application of efficient electrical and cooling engineering solutions, the energy efficiency rate is very high. The new RUG data center achieves a Power Usage Effectiveness Ratio (PUE) of 1.25 or lower. The residual power that is not used to power the server thus drives other systems such as cooling, power protection or lighting," says Tony Masure (Business Development Manager UPS at Legrand).

Within the university world, there is a sharply increasing demand for reliable and large data storage, superfast data processing, and high-quality computing capacity. A strong and future-proof data infrastructure is crucial for a university like the RUG to continue working on large research projects at an international level.

For the construction of a new data center, the university engaged the services of EQUANS, VSK Kastenbouw, and Legrand, among others. Thanks to excellent cooperation between these partners - combined with a customer-oriented approach - the construction time of this project was barely one year.

INTERACTION BETWEEN EXPERIENCED PARTNERS

The initiation of the project started in 2018, beginning with the calculation phase. EQUANS acted simultaneously as installer and integral general contractor for the design, permits, construction and site. At the start of the project, they immediately brought Legrand – together with data center expert Minkels – and VSK Kastenbouw around the table. This meant that all the specialists could make full use of their knowledge and know-how about

all the necessary components from the outset: cable support systems, busbar systems, UPSs, distribution boxes, data center cabinets... A wide range of solutions was reviewed.

FLAWLESS PROJECT MANAGEMENT, FROM CALCULATION TO COMPLETION

During the preparation and execution of the project, the corona pandemic threatened to throw a spanner in the works when it came to the delivery of materials and communication between the cooperating partners and the customer. Due to the excellent relationship between EQUANS, Legrand, Minkels, and VSK Kastenbouw, specific bottlenecks were addressed from the start through regular (digital) consultation. Even the Factory Acceptance Test of the UPS systems took place virtually and went according to plan.

INTERNATIONAL REFERENCE FOR DATA CENTER APPLICATIONS

The RUG sets high standards for protecting information and guaranteeing the continuity of IT processes. The new HPC (High Performance Computing) data center will therefore be certified by TüV. It is essential that every part of the entire energy distribution system meets these high standards. For instance,

Legrand developed and installed two high-end UPSAVER 3VO UPSs of 1000kW each for the power protection.

Busbar trunking, cable support systems, main and sub-distribution boards, and Minkels cabinets – produced in Veghel – were also used. The use of sustainable cooling techniques, such as cooling the supercomputer with water instead of air, contribute to this high-tech total solution as well.

OPTIMAL FOLLOW-UP AND AFTERCARE

In the coming months, the new data center will be further prepared for a phased installation of new IT systems, as well as the migration of existing hardware and applications. RUG will start a unique partnership with EQUANS, with a service contract that will last for 1 year. In cooperation with maintenance partners, Legrand will provide ongoing maintenance support services, as part of the 15-year maintenance plan.

Despite the threat of the corona crisis and supply chain disruption, the completion date was reached on time, with an exceptionally strong result in the field of infrastructure and technical components. ◾

CUSTOMERCASE

INFRABEL

A close partnership on the tracks

> "Because data centers are critical infrastructures, it is essential that the most reliable and durable racks are provided."
>
> *Alain Janssens, Data Center Manager at Infrabel*

Every day, thousands of trains travel on the Belgian railroad network. The railroad infrastructure and safety systems are managed by Infrabel. In order to steer train traffic efficiently and reliably in the right direction, a flawlessly functioning data infrastructure is crucial.

Legrand and distributor Kannegieter joined forces to supply racks for Infrabel's various data centers. The goal? To offer a total package of future-proof, robust and sustainable data center racks and related services, while respecting the agreed deadlines and taking into account the specific needs and wishes of the railroad manager.

STRICT CRITERIA

This project shot out of the starting blocks in 2017. That's when Legrand, Kannegieter and Infrabel concluded a framework agreement. Alain Janssens, data center manager at Infrabel, outlines the framework as an end customer: "For our data centers in Brussels, Muizen and Monceau, we needed high-quality data racks, supplemented with the necessary cabling. This material had to meet strict technical requirements for, among other things, optimal airflow management and cable management. After all, an outage in a data center means that trains are not running, which of course has a serious negative impact on train traffic in our country. Moreover, our data centers are identified as nationally critical infrastructures."

LEGRAND AND KANNEGIETER AS PRIVILEGED PARTNERS

After drawing up specifications and conducting a market survey, the partnership of Legrand and distributor Kannegieter emerged as the most interesting party. "Having been a joint supplier to Infrabel for almost fifteen years, we were able to tailor our offer well to the technical, service and price criteria of the rail operator" confirms Mathieu Bovy, Business Development Manager at Kannegieter. "The real start of the project took place in the December 2017, with the preparation of a detailed offer. From then on, it was important to meet regularly with colleagues from Legrand and Infrabel to continuously monitor the entire project and make adjustments where necessary."

DATA CENTERS: WIDE RANGE OF APPLICATIONS

Data centers are crucial to Infrabel for optimal management and service delivery. "We deploy our data centers for a wide range of internal and external services" says Alain. "The control of the railroad network is one of them, but there is also the management of customer relations or of our own cell phone network, so that we do not have to depend on external operators. Because of these critical applications, we set the bar high for the installation and delivery of the data center racks. Each subproject simply had to be completed flawlessly and as quickly as possible."

"Because data centers are critical infrastructure, it is essential that the most reliable and durable racks are provided."

PROJECT-BASED APPROACH

Alain indicates that the collaboration with Legrand and Kannegieter was excellent: "For each subproject, we wanted to apply a project-based approach, whereby quick adjustments could be made to omit or add building blocks to proposed solutions." Lieven Vansteenkiste, Sales Manager BeLux Legrand Data Center Solutions, can confirm this: "In large-scale projects such as this one - in which we supplied a total of 285 data racks - we are often confronted with unexpected challenges in practice. For example, the specific location of Klein Eiland - without a loading quay - provided the necessary logistical puzzle to get all the equipment on site in safe conditions. However, Kannegieter's colleagues provided excellent coordination here, so Alain and his Infrabel colleagues did not have to worry about this."

COORDINATING AND ANTICIPATING

The experts at Legrand and Kannegieter have been perfectly attuned to each other for years, and this is also evident in the preparation and execution of this project. "As a team, we want to relieve the end customer of all their worries in all phases of the project," points out Mathieu. "We pay great attention to good coordination and quality control, so that the installed solutions always meet the predefined design. In this project, we also anticipated the short lead times. We did this by keeping several installation teams on standby, which allowed us to react very quickly. In addition, the products were assembled in advance. While this made the preliminary process a little longer, it resulted in a much faster on-site installation."

NEXPAND SOLUTIONS TAILORED TO THE CUSTOMER'S NEEDS

"With the Nexpand server and network cabinets, complemented by Nexpand Corridors, we offer Infrabel an ideal solution for modular and energy-efficient data centers" explains Lieven. "This flexible environment gives the customer plenty of room for future modifications. At the same time, we provided customization for retrofit corridors that were built into existing cabinets. And also to the specification requirement of the most economical application, we were able to provide an answer for the optimization of the PUE value."

Alain adds: "In our old data centers, cold air was blown into entire rooms to cool them. Today, thanks to the use of the latest containment solutions from Minkels, the volume to be cooled is a lot smaller. This quickly results in considerable energy cost savings. Energy efficiency is a very important strategic policy point for Infrabel. Data centers consume an enormous amount of energy, and so together with Legrand and Kannegieter we continue to make the necessary efforts to reduce our ecological footprint." ◼

Mathieu Bovy, Business Development Manager at Kannegieter and Alain Janssens, Data Center Manager at Infrabel

CUSTOMER*CASE*

How **TABOOLA** overcame PDU failure in their data center

Taboola is the world's leading recommendation and native advertising platform. The company has data centers around the globe, with several in Israel, where it was founded in 2007.

CUSTOMERCASE

OVERVIEW

Taboola had long employed a competitor's vertically mounted Zero U rack power distribution units (PDUs) that supported loads between 10 to 15 kVA per rack in its data centers. These Zero U rack PDUs consistently caused data cable management and thermal issues, driving Taboola to implement horizontally mounted rack PDUs. However, even after moving to a competitor's horizontally mounted rack PDU, the Taboola team continued to experience frequent failures of its deployed PDUs.

SOLUTION

After an audit of its data centers' power needs, power capacity limits, and thermal and environmental conditions, Taboola's engineers determined the maximum headroom within their enclosure systems. The Taboola team, realizing that its currently sourced PDUs were not meeting rack demands, decided to replace the existing solution.

Working with Legrand's power experts to source a more robust solution, Taboola switched to Raritan

PX-5000 Series horizontally mounted PDUs to resolve PDU failures and to better promote an unobstructed path at the back of the rack for better airflow and cooling. The Taboola team also liked that Raritan PDUs offered fullcolored chassis configurations to help easily identify the A and B power infrastructure ensuring redundancy and simplifying future troubleshooting.

The 5000 Series has a 60°C temperature rating, a significant increase from the 45°C rating of its previously sourced PDUs. In addition to the increased ratings, Raritan PX-5000 PDUs offered superior intelligence that enhanced Taboola's energy management and monitoring capabilities. These features include real-time remote device level and individual outlet-level switching and power monitoring of current (amps), voltage, power (kVA, kW), power factor, and energy consumption (kWh) with ISO/IEC +/- 1% billinggrade accuracy.
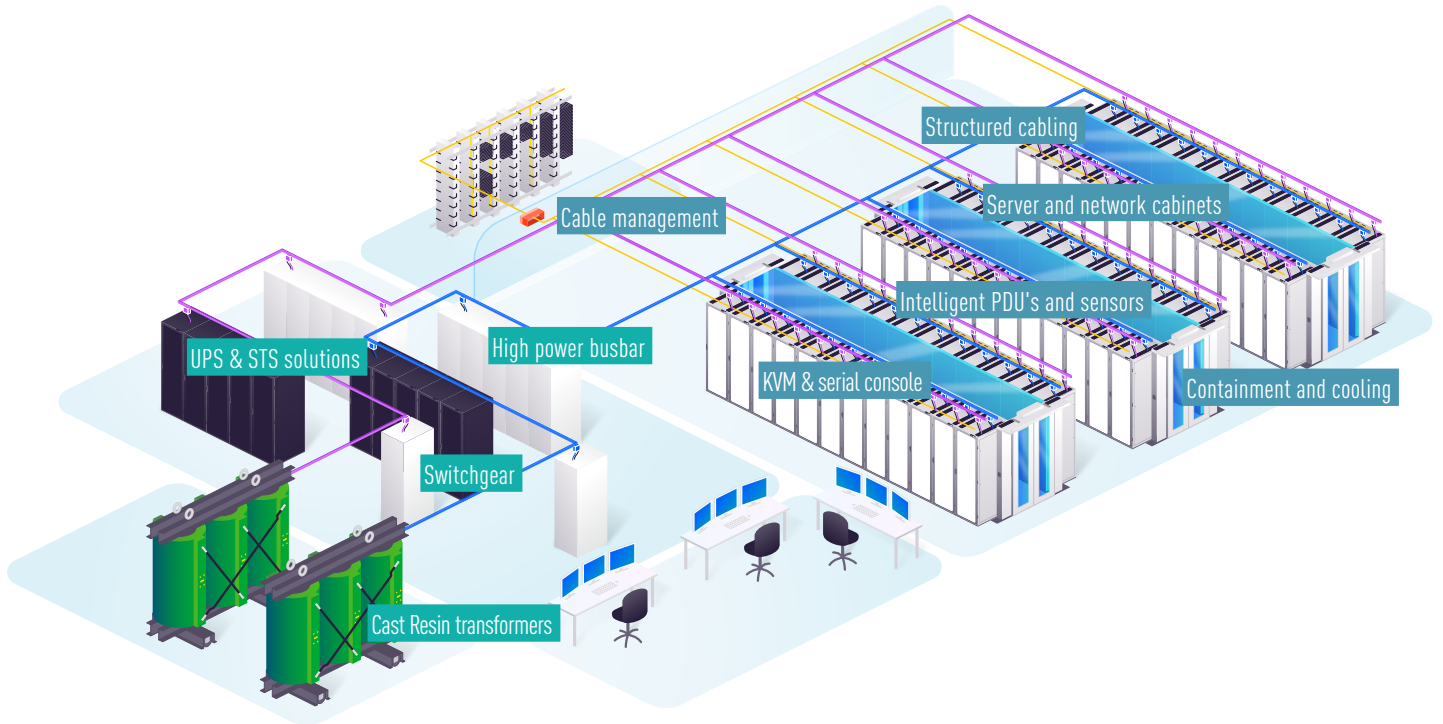
RESULTS

By deploying Raritan PX-5000 PDUs, Taboola not only eliminated the recurring problem of PDU failures

and the inherent safety issues they caused but also improved its overall monitoring capabilities. The increased level of intelligence delivered through the Raritan Xerus Technology Platform facilitated Taboola's ultimate goal of developing its own data management software. The platform's management and monitoring capabilities also allowed Taboola to define specific thresholds and receive alerts when they were crossed. This proactive approach helped better identify when power or environmental conditions were becoming a threat before critical issues arose.

CONCLUSION

The Taboola team stated that Raritan PX-5000 Series horizontally mounted PDUs are outstanding in form and function. Additionally, they performed above expectations when Taboola stress-tested them in sub-optimal environmental conditions in the field. With accessible interoperability, monitoring features that help identify problems in advance, and physical design elements that adapt to the harshest conditions, the 5000 Series has effectively protected Taboola's critical loads under all situations. ■

![Legrand logo]

Reliable, efficient, scalable
data center solutions

Diagram labels:
- Cable management
- Structured cabling
- Server and network cabinets
- Intelligent PDU's and sensors
- UPS & STS solutions
- High power busbar
- KVM & serial console
- Containment and cooling
- Switchgear
- Cast Resin transformers

OUR SPECIALIST BRANDS

legrand®
Complete global solutions for digital and electrical infrastructure.

BORRI
Specialist in UPS for industrial applications and datacenters.

CABLOFIL
Using its global strength and market leading position, Cablofil has developed a complete range of cable management solutions.

COMPOSE
Specialist in passive data communication solutions, cabling of data centers, buildings and fiber optic infrastructures.

GEIGER
Data center fiber optic infrastructures, data center design and DCIM (monitoring & management) service and implementation.

MINKELS
Turn-key hot/cold aisle containment and enclosures for data center infrastructures.

modulan
Provider of fully customizable containment solutions. Maximum flexibility to cover customer needs.

Raritan
Proven leader of intelligent PDUs, transfer switches, environmental sensors, serial consoles and KVM-over-IP Remote Access switches.

Server Technology
Leading specialist in customer-driven power, access and control solutions for monitoring and managing critical IT assets.

Starline
Starline has grown to become a global leader in busbar power distribution equipment

U Systems
USystems provide cooling products that enhance data center cooling, providing these to global businesses, making their data centers more environmentally friendly.

ZUCCHINI
Zucchini has become a leading brand of cast resin transformers, offering one of the most comprehensive ranges on the market.