

FEATURES: DBs, SWITCHES, SOCKETS AND PROTECTION | TOOLS OF THE TRADE | LIGHTING

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We have almost reached the end of 2019 and many of you will be taking a welcome and well-deserved break over December. To help ease your way into the holiday spirit, a number of our advertisers have donated a wonderful selection of gifts that you can win simply by entering our African Summer competition. Open this page to reveal the line-up of gifts on offer.

DRAW

All the entries that we receive will go into a big box and the advertisers who have donated gifts will join the Sparks team to draw the names of the lucky winners. The gifts will be delivered to the winners, whose names will be published in the February issue of Sparks Electrical News.

HOW TO ENTER

There are three ways to enter the draw

1. Scan the QR code on this page to go straight to the online entry form, and fill in your details.
2. Log onto the Sparks website (www.sparkselectricalnewsmagazine.co.za), click on the African Summer banner, and complete the online entry form.
3. Email your name, company name, postal address and telephone number to promotions@crowm.co.za

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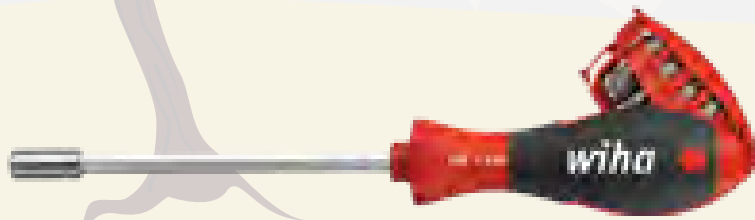


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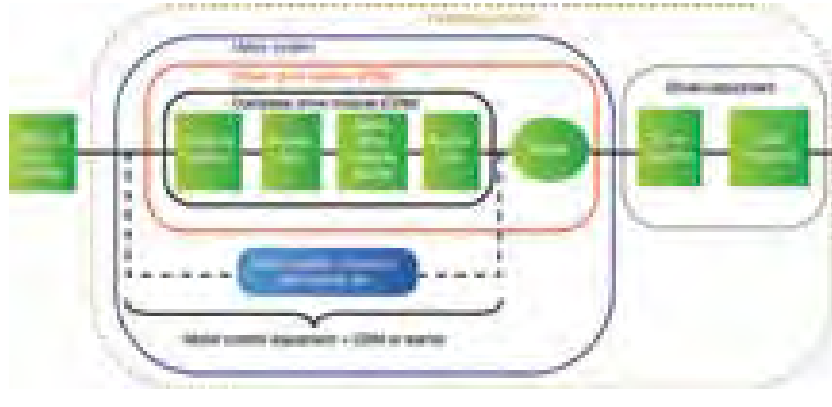




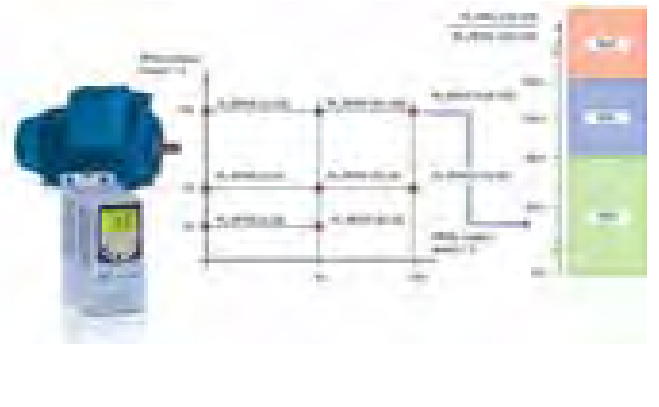
MOTOR EFFICIENCY HIGH ON GLOBAL AGENDA



A WEG motor and drive combination.



Extended product illustration showing the motor system, power drives system and complete drive module.



Power drives system torque, speed and efficiency.

With electric motors consuming almost 70% of industry's energy, companies are always looking for better motor efficiencies. For many years, motor efficiency have been well defined; however, when driven by a variable speed drive (VSD), the VSD efficiency and the total efficiency of the VSD and the motor has not been well understood. Choosing the right product combination can also be more difficult as manufacturers' data is not always easily comparable. This is where the international IEC61800-9 standard comes to the rescue, according to global motor and VSD manufacturer WEG.

The IEC61800-9 standard – based heavily on the previous EN 50598 standard – gives manufacturers a clear framework for grading a complete motor system. End-users can compare the overall efficiency of a manufacturer's products, irrespective of design and component selection.

The IEC61800-9 standard uses the Extended Product (EP) approach. This considers the efficiency of the Motor System, which is comprised of the Motor, the Basic Drive Module (BDM), the Complete Drive Module (CDM). Together, these make up the Power Drives System (PDS), which also includes any switchgear and controls.

This terminology sounds confusing but is just a technical way to say: Switchgear + VSD + Motor. The efficiency levels are defined by considering eight different operating points, covering low to high speed

and torque. The user can easily compare his application load and speed requirements to the motor system defined speed and torque points.

The EP approach employs a semi-analytical model to calculate the efficiency of each of the components at the operating points of the driven equipment. The calculations are also based on tested and verified values. This results in the most efficient component selection for the application.

Using this standard, the user may be assured that:

- A motor complies with the defined motor efficiency levels of IE1, IE2, IE3, IE4 or IE5;
- A VSD complies with VSD efficiency IE0, IE1 or IE2; and
- The manufacturer's motor and VSD used in combination will meet or exceed a system energy standard of IES0, IES1 or IES2.

Using this EP approach, the European Commission expects the increasing use of more efficient systems to help achieve its targets for carbon dioxide (CO₂) reduction. In line with these efforts, WEG VSDs and IE2 motors in combination achieve IES2. And significantly, WEG's VSDs and IE3 efficient motors exceed the highest system levels of efficiency. Additionally, WEG has product lines that exceed even IE4 and IE5 classifications.

Recognising that global population growth and economic development are driving up energy demand around the world, the European Union has set stringent targets to reduce CO₂ emissions.

These aim to cut emissions by 40% by the year 2030. This means creating more renewable energy sources, and also increasing the energy efficiency of industrial systems. Studies suggest that almost half of global energy consumption comes from industry – followed by commercial and residential use.

The EC's regulation 640/2009 already requires that all electric motors operated from a variable speed drive or inverter must adhere to a minimum of IE2 to be eligible for sale. Fixed-speed applications must meet a minimum of IE3 to comply.

Where a motor does not operate at its nominal torque and speed, the variable speed drive represents a significant opportunity for energy optimisation. In addition, the greater the range of speed variation results in a greater PDS efficiency. Using WEG's IE2 motors with any WEG variable speed drive can achieve an efficiency classification of IES2. However, using other WEG lines of motors with the right drive, much better levels of efficiency can be reached.

WEG has a complete line of variable speed drives which exceed the IE2 requirements outlined in the IEC61800-9 standard. When combined with its robust and reliable motor line, the products create an integrated solution for all applications.

Enquiries: www.zestweg.com

ARTISANS RECOGNISED AT AWARDS CEREMONY



From left to right: Linas Precious Mdhuli, Paseka Jeff Khoeli, Johan Basson (MD) Lerato Joy Mothibe, Makgang Georginah Kgaditsi and Gordon van der Merwe (Governance Manager).

JB SWITCHGEAR SOLUTIONS embarked on an artisan learning programme for those members of its staff who had the necessary tertiary qualifications. After an intense training schedule, the candidates were successful in obtaining their trade test qualifications as electricians. The programme was done in partnership with the service provider SAJ Competency Centre in Wadeville.

JBSS is proud to be associated with such an initiative to uplift the skills of its staff and improve their lifestyle and give back to the manufacturing industry. JBSS will continue with these initiatives to encourage candidates to obtain their qualifications, and artisan status.

Enquiries: info@jbswitchgear.co.za

AFRICAN MINES GEAR UP WITH REFURBISHMENT SERVICE FROM SEW-EURODRIVE

A convenient and cost-effective option for ageing African mines, some of them 50 to 60 years' old, is to have their geared units professionally and cost-effectively refurbished by SEW-EURODRIVE (Pty) Ltd. Supplementing its refurbishment capability, the drive engineering specialist can also offer a drop-in gearbox replacement service. Geared units are particularly difficult to refurbish or modify on mines, as their large size means that production has to be halted temporarily in order to gain access. SEW-EURODRIVE is now able to replace historically-inefficient worm gear units with the latest helical and helical bevel gearboxes, made from case-hardened steel for maximum durability. The major advantage for mining clients, in particular, is that no modification to or adjustment of the original geared unit is required.

Enquiries: www.sew-eurodrive.co.za

3D LASER SCANNING SERVICES FOR DESIGNING LIGHTNING PROTECTION MEASURES

3D laser scanning, which can be used to capture real world information, delivers many benefits for industrial and engineering projects, providing precise and reliable data which allows for improved planning and scheduling. Without physically touching what is being measured, 3D laser scanning creates clear and precise digital records of existing conditions. Laser scanners send out a laser beam that is subsequently reflected off the structure or environment being scanned. The distance and reflectivity of each return signal is measured and recorded, creating a 'point cloud'.

Hano Oelofse, MD at earthing and lightning protection company DEHN Africa, says this 3D imposition helps to protect plants and other constructions, explaining: "3D laser scanning makes it possible to quickly and easily take the exact measurements of complex objects and building structures. With the help of a laser scanner, existing plants and structures can be recorded and digitalised. At DEHN Africa, we are able to offer this service not only for lightning protection systems, but for any building, structure or plant that needs precise drawings of the complete layout."

3D scanning works as follows:

- The scan produces millions of measurement points called coordinates. Together the points create the raw data in the form of 'point clouds'.

- The individual point clouds and pictures produced in the scan are processed and consolidated using appropriate software.
- The result is a detailed 3D model.

Oelofse continues, "The intricate detail of these points means that a person can get an exact measurement anywhere in the point cloud. DEHN Africa is able to use laser scanning to put together a lightning protection design for an existing building or plant. The process of creating your lightning protection design also gives you a 3D model of your plant itself, which can then be used for other types of planning and processing as well."

Oelofse says the advantages of the DEHN 3D offering include the following:

- Recording the as-built situation creates an accurate, high-quality design.
- While the preliminary planning stage benefits from time saving, time-consuming redesigns that are based on old as-built drawings are also no longer necessary.
- Existing plants and other buildings are digitalised in their as-built state. The documents can be kept for future use.
- Different formats are available for further usage.

"Laser scanning is a valuable tool when designing, building, restructur-

ing and extending technical facilities. It offers many economical and technical benefits during the design, construction and operating phases, also helping to minimise risks, and providing higher standards of safety," concludes Oelofse.

Enquiries: +27 (0)11 704 1487





WIRED FOR A BRIGHT FUTURE



Sindi Kunene

Sindi Kunene started her business journey when she formed Zamagoza Solutions & Services, or ZMG, in 2016, providing electrical maintenance services to SAB's Rosslyn Brewery in Pretoria.

"After I had finished studying and become certified as an electrician, I went to work for a company to learn as much as I could about how to run a business, but my vision has always been to have my own

company. That was the dream," says Kunene. "At first I was just supplying electrical material to companies, but the plan was always for me to become involved in maintenance."

Today, due to the mentorship, business development support and training she received from SAB Accelerator – SAB's supplier development programme – her business is primed for success.

In 2018, Kunene became part of the SAB Entrepreneurship Programme through SAB Accelerator – one of several entrepreneurship development programmes – committed to growing the company's supply chain to be inclusive of black-owned businesses through coaching and technical expertise. This assists budding entrepreneurs glean understanding of the SAB landscape, its value chain and integrate them into the business. The programme also helps its suppliers by equipping the necessary business skills to grow their businesses in order to adapt to becoming suppliers for other businesses.

Her main business coach, Mbali Zamisa Senior Business Coach at SAB Accelerator, said that ZMG had come a long way through workshops and coaching. "Through the programme we assist our suppliers across their business, from technical aspects, to learning how to pitch their businesses to new clients, and how to become trusted suppliers to SAB," Zamisa said.

"Sindi joined the programme in July 2018 and she graduated in December 2018, during that time she grew her client base. She was selected to join our Amplify programme which gives extra coaching, access to market, and access to learning materials.

Accelerator has a team of 20 dedicated employees, who include coaches, and engineers who advise on the business and technical aspects of the business across different disciplines including finance, supply chain and marketing. SAB Accelerator has a holistic approach to working with businesses, and a 360-degree view of how to make sure that they are reliable suppliers for SAB.

ZMG has five permanent staff members and, if necessary, they are in the middle of a big project then Kunene sub-contracts other contractors. "Being in maintenance means you have to be available at any time of the day or night, and you have to pitch up and do the work really well so that the name of your business spreads," said Kunene.

While being a supplier to SAB is a big deal for a new business, the role of the Accelerator is also to progress companies towards offering their services to other businesses. ZMG is already on the database of another company in Wadeville and although they haven't done much work for them yet, it's something Kunene is proud of. Zamisa says, "Sindi and ZMG really earned their stripes while on Accelerator. Coaching and guiding a black-woman-owned business is a rewarding part of my job."

Enquiries: www.sabentrepreneurship.co.za

SASOL AWARD FOR ACTOM TURBO MACHINES

Petrochemical giant Sasol has recognised ACTOM Turbo Machines with one of its top 2019 awards for exceptional service in repair, refurbishment and ongoing maintenance. The award in the 'Top Performing Service Supplier: Large Enterprises' category was recently made by Grace Ndwammbi, Sasol's senior vice-president supply chain to ACTOM Turbo Machines' managing director Chris Bezuidenhout at Sasol's head office in Sandton.

A division of ACTOM (Pty) Ltd, ACTOM Turbo Machines is the only large non-OEM business in its service category to win the award to date. Since its inception six years ago, it has become the largest non-OEM turbo-machinery and high-speed rotating equipment service provider in sub-Saharan Africa.

Sasol is very OEM-reliant in terms of service backup and parts supply, according to Anton Hamman, Sasol's principal specialist sourcing

mechanical equipment. Nonetheless, ACTOM Turbo Machines has proved itself in service provision for turbo machines, where critical and complex skills are required.

"We view turbo machines as the heart of our operations, so it is absolutely essential that the service provider has all the critical skills needed to ensure that the equipment is maintained to OEM specification," Hamman says. "If you use a non-OEM company for this work, you must be certain they have the required skills and competencies to perform this work to the correct standard every time and understand the associated risks."

He highlights that safety awareness was a critical aspect of this service. The 36 MW machines in Sasol's oxygen plant, for instance, are extremely large and heavy. This makes them difficult and potentially dangerous to work on.



Anton Hamman (second from left), Sasol's principal specialist sourcing of mechanical equipment, congratulates Chris Bezuidenhout, managing director of ACTOM Turbo Machines, on receiving the prestigious Sasol award. From left are: Leon Greeff, Sasol's senior manager, oxygen electrical & instrumentation; Mervyn Naidoo, ACTOM's Group CEO, and Nicholas Mokgosi, Sasol's senior manager E/C & I sourcing, category management.

PRC CONNECTORS – MORE POWER, LESS SPACE

PRC Circular Connectors from Phoenix Contact offer device manufacturers and installers significant advantages compared to conventional cabling systems.

The state-of-the-art device connection offers functions that save both the device manufacturer and the installer on site time and costs. In addition, depending on the application, the PRC Connector is robust and suitable for external applications. Inverted cable connectors and couplings are the solution for reliable cable-to-cable connections in building, industrial and outdoor applications. Modular basic housings and contact inserts also make angled conductor outlets possible for the first time. The housings are available in different versions for 0°, 45° and 90° exit angles and can be equipped with contact inserts for socket or pin contacts depending on the application.

The inverted connectors and contact inserts are available in three- or five-position versions and offer a high degree of protection up to IP69K. The circular connectors are designed for currents up to 35 A and voltages up to 690 V ac, and are up to 75 percent more compact than conventional industrial connectors. Thanks to the weatherproof materials, they are also suitable for indoor and outdoor use.

Enquiries: www.phoenixcontact.com



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ACDC PARTNERS WITH FIDELITY ADT



ACDC Express Fourways recently hosted a customer day at its premises in Johannesburg. The main objective of the customer day was to launch the ACDC Dynamics security and react alarms Fidelity ADT Security campaign whereby any of the company's staff are able to offer clients a free rented Fidelity ADT alarm system, or a rent-to-own CCTV solution.

Established in 1984, ACDC Dynamics is a leading manufacturer, importer and distributor of quality products in the electrical, electronics, pumps and tools industries. Employing over 700 staff, ACDC Dynamics has its Head Office in Edenvale, Johannesburg with branches in Germiston, Cape Town, Pinetown and Riverhorse in KZN.

Enquiries: www.acdc.co.za

IRP'S FAVOURABLE OUTLOOK ON RENEWABLE ENERGY

The South African Institute of Electrical Engineers (SAIEE) has welcomed the new Integrated Resource Plan (IRP), and in particular, the energy master plan's positive attitude towards growing renewable energy and storage in South Africa. The 2019 IRP was gazetted by government in October this year. SAIEE CEO, Sicelo Xulu said that the new IRP was long overdue as the last one was published almost a decade ago in 2010. "Since then several new technologies have been introduced, not to mention environmental developments, which require an updated plan that considers all the factors needed to achieve a sustainable energy future for South Africa," Xulu said. The SAIEE believes that the integration and strengthening of renewable energy is vital for energy planning in the country.

"Considering the declining costs of solar and wind generation, we are pleased to note the plan allows for a significant increase in the renewable energy mix, from 6% to above 25% by 2030. The SAIEE is also pleased that the allowance for energy storage has been increased by 66% to 5000 MW as we requested," Xulu said. It is also good to see the accommodation of these new resources on a distributed or 'small scale embedded generation' basis, in a way that will unlock new opportunities within the municipal distribution industry.

"This will assist in limiting renewable energy curtailment and technical losses while managing increased variability in the grid. Alternative energy storage costs, such as batteries, are also declining and making their business case easier," he added.

Xulu said the SAIEE is confident that its other recommendations to the Department of Mineral Resources and Energy will also be considered favourably. SAIEE's proposal includes moving towards a publicly available open-source IT platform for housing the energy model, instituting a scientific approach to decommissioning of assets, and commissioning a study to determine the technically responsible limit for renewables, before implementation by the Department. "We affirm our support for a safe, green and lower-cost mix of energy technologies; however, we want to caution that the primary purpose of a grid, which is to provide a safe and reliable access to energy supply, must be maintained through careful engineering studies," Xulu said.

As part of the SAIEE's commitment to South Africa's energy future, the Institute hosted its inaugural SAIEE National Conference in November. The conference looked ahead at how we can 'Engineer an Africa for the Future' by bringing together local and international thought-leaders to brainstorm critical issues; namely, building a sustainable energy future using a mix of technologies, including existing fossil fuelled plant, gas, renewable energy and storage, and nuclear, all in conjunction with the impact of the Fourth Industrial Revolution.

Enquiries: www.saiee-conference.co.za

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SURELY THERE ARE BETTER BATTERIES?

The first electric power was direct current, dc, and was first made from a battery built by Alessandro Volta. His friend, Luigi Galvani, was dissecting a frog affixed to a brass hook. When he touched its leg with his iron scalpel, the leg twitched. Galvani believed the energy that drove this contraction came from the leg itself, and called it 'animal electricity'. In fact, it was the current passing from the iron to the brass which contracted the frog's muscles. Volta made a battery, being a 'voltaic pile' consisting of pairs of copper and zinc discs piled on top of each other, separated by a layer of cloth or cardboard soaked in brine.

On the internet you can find many projects which will duplicate Volta's experiments. Batteries are still with us in many forms, and all of them rely on two dissimilar metals being separated by a fluid or chemical paste. The most common non-reusable batteries are alkaline batteries which use zinc oxide and magnesium chloride as the two reactive elements. There are also rechargeable batteries, such as lead acid automotive batteries, nickel cadmium batteries and lithium ion batteries.

The world of non-reusable batteries is in many ways similar to the trade in hard drugs. The manufacturers and distributors mark battery

prices up by up to five times the manufacturing cost. They package the batteries in lots of four or three or six or five – never in two or ones. They make loud and deceptive claims: "Lasts Longer!" They write it on the packaging. Lasts longer than what? Sand in a desert? Ice cream in the sun?

Suppliers of batteries for UPS systems and renewable storage charge a fortune for the batteries and say they have a "25 year guarantee!". In the small print they say the guarantee only applies if the battery is stored within certain temperature limits, which means you have to fit the battery room with air-conditioning if the limits are to be maintained, which is a non-proposition.

The big problem with solar and wind energy is that on a windless night you have to use other power sources, some of which may be costly. The solution, we are led to believe, is battery storage. The Tesla battery in Australia is a battery with a power output of 100 MW and a energy storage of 129 MWh. It is hailed by many Australian academics as a wonderful milestone, but, if you do the math, this is 100 MW for 1.29 hours which is not much in a state the size of South Australia. Of course, it is also 10 MW for 12.9 hours which is equally trivial. We have to bear in mind that to get the 129 MWh into the batteries will take at least 10 MW

supply for 12.9 hours during which time the battery will be unavailable. Thus, the operating point for long lasting availability is more like 5 MW for 12 hours. It's a great idea on paper but in practice, all it is, is a means to comfort renewable energy supporters when they realise that the wind doesn't always blow and the sun doesn't shine at night.

I am being cynical, but the construction of such a battery could be done in the back yard with a few hundred thousand cordless drill batteries and some water cooling. Nothing too smart.

What has to happen is the invention of a new type of portable power source which will replace batteries. I can think of a few technologies – fuel cells being one – which would be better and cheaper and produce less waste. However, there is such an income from batteries that there is no incentive to improve them. To develop a battery which is good value for money, long lasting, with high energy density is completely counterproductive to good business practice. And yet it is a very necessary requirement. There are ongoing developments: solid state lithium ion batteries, gold nano wire batteries, grabat graphene batteries and laser made super capacitor batteries. These promise batteries which can be charged in minutes and discharged over hours. Here's hoping it will happen in my lifetime.

CANNABIS IN THE WORKPLACE POST 2018

The use of cannabis in the workplace has caused some confusion among mines belonging to surface mining association, Aspas, and has led associate member, Workforce Healthcare, to offer some explanation.

According to the company's managing director, Dr Richard Malkin, the road since the Dennis Davis case in 2017 defined that it's an infringement of an adult's constitutional rights not to be able to smoke Cannabis in their home. The Constitutional Court also declared it legal to use Cannabis in your own home, privately.

High Court:

- Prohibition of use and cultivation for personal purposes in private is unconstitutional.
- Criminalisation of use and possession for personal purposes in private is unconstitutional.
- Right to privacy unjustifiably limited.

Constitutional Court:

- Confirmed High Court's views but did not limit "private" to a person's home or private dwelling.

The Legislator of Parliament has until September 2020 to ensure that all the elements to support this change of legislation is in place.

Background to the Management of Substance Abuse at the Workplace

The Preamble of the Occupational Health and Safety Act No. 85 of 1993 states, "to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery: The protection of persons other than persons at work against hazards to health and safety arising out of or in connection with activities of persons at work; to establish an advisory council for Occupational Health and Safety and to provide for matters connected herewith."

The main sections of the Act are:

- Section 7 – Health and Safety policy;
- Section 8 – Duties of Employer;
- Section 12 – Duties of Employees;
- Section 16.1 – CEO of the Organisation; and
- Section 38.2 – regarding breach of this Act including the s-16.1 is R100 000 fine or up to two years in jail.
- Section 14 of the Constitution: Everyone has the right to privacy
- Section 22A(9)(a)(1) of the Medicines and Related Substances Control Act 101 of 1965 (read with GN R509 of 2003)
- Section 4(b); 5 (b), Part III of Schedule 2 of the Drugs and Drug Trafficking Act 140 of 1992
- Section 65 Road Traffic Act 93 of 1996
- Mine Health and Safety Act 29 of 1996
- Regulation 4.7.1 of Minerals Act 50 of 1991

The policy defines the rules of the workplace regarding health and safety. This protects the employee as well as the employer, particularly with regards to the Labour Court. Hence, it's important to be able to have a policy and procedure that is set-up and defines the rules of the workplace that people are managed by.

Up until September 2018, it was acceptable for a policy to state zero tolerance to illegal substances and no illegal substances would be allowed. Hence, during the procedure of doing a screening test, which is the standard procedure that takes place at the workplace, urine that tested positive for cannabis automatically defined the employee as unfit according to the standards and policies of the Company.

Proving the presence of active THC

According to Greg Kew Situation report: *Cannabis use, recent South African court rulings and impacts on workplace testing & risk management 2018*, saliva tests measure the active ingredient of cannabis, whereas urine tests the breakdown metabolic product. Hence with cannabis no longer illegal it doesn't make sense to test urine. Urine test detects the breakdown product hence one cannot prove the presence of active ingredient, it might have been ingested a week ago in a urine test.

Now, post September 2018, (Dennis Davis judgement) cannabis is no longer illegal. Hence, if a person is tested positive for cannabis, this no longer proves that the employee is not fit to work. Hence, to prove that the employee is not fit to work, confirmatory testing needs to be done. This requires the urine sample to be sent to a Toxicology Lab or Pathology Lab for confirmatory testing, which is a gas or liquid chromatography procedure. It is expensive and courier fees must be included. The process is quite complex as it requires the chain of custody to be unbroken. Generally, the employee will then be declared unfit and would be suspended for two to three days until the results are available.

To prevent the complications of hypersensitivity of the urine test it's probably a good idea to swap the testing to saliva. Saliva is only sensitive for approximately twenty-four hours, as the concentration in the saliva drops after one day and is no longer measurable. This reduces the number of false results.

Specifically, for industry, it is critical that the policies and procedures in the testing mechanisms are well defined. The risk exists for the Section 16.1 appointment, if the correct policies and procedures are not in place and if a driver were to be under the influence of cannabis and in an accident causing damage and potentially harming, life the

liability sits with the Section 16.1 of the Act.

With regard to the Road Traffic Act, till 2020 there is no standard in place to define what the safe limit is for a person to drive a vehicle having been exposed to cannabis. The international standard is anywhere between 0.1 – 0.5 nanograms /ml point which is a very small number.

So, what are the challenges we face?

- To review policies and procedure.
- To review the testing procedures and what type of testing needs to be done.
- To be able to ensure that drivers are very tightly managed.
- To ensure that they are safe on the road.

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HOW TO GET YOUR WIREMAN'S LICENSE

In the first part of the series on how to become a professional registered electrician, we briefly touched on the different aspects of the journey and how long it could take. The first step is to get your Wireman's License, a process that may seem a little intimidating at first, but is actually quite straightforward.

You will need your Wireman's License to ensure that you operate legally in South Africa. It is a valuable piece of paper that not only affirms the hard work you put into your studies, but proves to all your potential customers that you know exactly what you are doing. With this license in your hands you will be allowed to issue a CoC (Certificate of Compliance) and prove your competence to test and inspect electrical installations. A Wireman's License is not the same as your DOL registration to become an electrical contractor, that's the next step in the journey.

You do need to get a recognised qualification before you set off to get your Wireman's License. The South African Qualifications Authority provides you with a complete breakdown of precisely the qualifications you need to qualify for this certification. You can opt for doing a degree or you can attend a trade college, undergo an apprenticeship and pass a trade test to become qualified. This is typically used by people who have qualified overseas and want to verify those qualifications in South Africa.

There are so many different institutions and courses that can help you to become an electrician that it may seem a little overwhelming at

first, however, your most important step is to ensure that it is recognised by EWSETA.

Now you need an EWSETA accredited assessor to assess you

A registered assessor will determine whether or not you are able to do the job. They will ask you to perform specific tasks and prove that you can correctly evaluate a CoC against an existing electrical installation. This is incredibly important as only a qualified, registered electrician is able to issue a CoC and the assessor's job is to ensure that you know what you are doing.

If EWSETA is happy with your work and you've passed all the relevant tests, then they will issue you with a letter that you submit to the DOL as part of your application for a Wireman's License.

According to the Department of Labour, your educational requirements need to be relevant across whichever registration you are applying for.

Know what the registrations are and how these affect your application

Electricians can register across three specific categories, each one allowing for them to work on different phases of installation with regards to electricity.

Phase 01: A single-phase electrician who usually works on homes and electrical supplies of 220 V. This is the most relevant one if you

want to install prepaid meters.

Phase 02: Installation electrician who can handle both single and three-phase installations, but isn't qualified for specialised installations.

Phase 03: A master installation electrician who specialises in hazardous locations and specialised electrical installations.

Once you have received your EWSETA Letter and achieved your qualifications, you can now submit your application for your Wireman's License to the DOL. You will need to follow the following steps to get DOL's attention:

- Have a trade qualification that includes electrician, electrical engineering, construction electrician, and other diplomas, degrees or qualifications that focus on the role of the electrician (Chemical, construction, mechanical et al).
- Pass the trade test, have a NQF Level 3 minimum with a Technical Senior Certificate and pass the Installation Rules Paper 1 and Paper 2 which can be written at an FET or TVET college.
- Documentation and certified proof of the qualification.

In the next issue, we will talk about the difference between the wireman's license and registration with the DOL as an electrical contractor. Be prepared to wait and use this time to keep learning and building your career.

Enquiries: www.citiqprepaid.co.za

TAKING SHOPPING MALLS TO THE SUN

South African shopping centre developer, Flanagan & Gerard Property Development & Investment, has invested more than R16 million to install state-of-the-art solar plants at its malls in an effort to save energy and significantly reduce its carbon footprint.

So far, over 3 MVA of solar energy generation capacity has been installed at three of their co-owned shopping centres, Vaal Mall (co-owned with Growthpoint Properties) Middleburg Mall (co-owned with Moolman Group) and Springs Mall (co-owned with Vukile Property Fund, Murinda Investments and Blue Crane Eco Mall).

A further solar plant for Mall of the North (co-owned with Resilient REIT and Moolman Group) is expected to be live before the end of the year, and capable of generating an additional 1 MVA. Added to that, Highveld Mall (co-owned with Resilient REIT, Mogwele Investments and Retraction

Props) will introduce solar to its energy mix in early 2020, increasing the total solar energy capacity at Flanagan & Gerard's retail assets to more than 5 MVA.

"Energy saving and going green are primary drivers for us, as we bring these shopping centres in line with the Flanagan & Gerard philosophy of making a positive environmental impact by using renewable resources," says Paul Gerard, MD of Flanagan & Gerard.

He adds, "Although SA is growing at a rapid rate in the alternative energy sector, we are not growing fast enough to relieve some of the pressure currently experienced by Eskom. There is uncertainty around Eskom and its ability to meet demand. We firmly believe that, as the private sector, we have a responsibility to continue to accelerate the expansion of renewable energy. The reduction of CO₂ emissions is a

major benefit of using alternative energy sources, and having our own independent supply comes with the added benefit of having more control over that supply."

Four of the centres have rooftop solar installations, while Vaal Mall has the only carport installation. "It is worth noting that since the installation, Vaal Mall's entrance five, where the carports are located, has gone from being the least used parking area and entrance to the busiest," says Gerard. "As a company, we are passionate about our world and looking after its limited natural resources. Reducing the carbon footprint of our shopping centres and future developments even further is high on our agenda," Gerard says.

Enquiries: www.fgprop.com

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EFFECTIVE AND DEPENDABLE POWER SOLUTION FOR SOLAR INVERTERS

The solar inverter accepts the input power source from the ac mains, battery, solar modules and switches between various operation modes depending on the operational conditions.

When connected to the mains whilst charging the batteries will feed into the load in direct mode. This will expose the inverter to high or low voltage, which will damage its circuitry. The AVS30 is then installed to protect the inverter by disconnecting the input main power when it's outside the limit of acceptable voltages.

Five power problems

The following problems can impact the solar inverter if the right protection isn't correctly installed to prevent the below events from occurring whilst in function.

High voltage

As power fluctuates due to unreliable mains or poor distribution network, the mains voltage can either drop or rise. A sustained over voltage event can be catastrophic and cause instant irreparable damage.

Low voltage

Similarly, low voltage can occur during fluctuations, over-stretched distribution network, excessive demand to the size of the utility or being at the end of a long distribution line. Low voltage is particularly damaging to equipment.

Power back surges

Commonly occur after power cuts. As the mains supply resumes, it usually returns with a surge that can be quite high and damaging in some instances. Ensuring the power has settled before resumption is important.

Spikes and surges

Power spikes are short pulses of energy on a power line and contain high voltage. These spikes only last a few milliseconds, but they have the potential to cause great

damage to sensitive equipment. Often equipment does not fail right away; however, in many instances when it does, this seriously affects the shelf life of any electrical equipment.

Loss of neutral

When the instance of LoN occurs, the line voltage will rise from a normal 220/230 V to 400/415 V causing instant catastrophic damage and even risk of fire.

Connect to AVS30

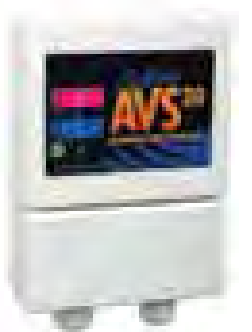
The AVS is an Automatic Voltage Switcher rated at 30 will switch off the equipment connected once the mains power goes outside pre-set acceptable limits and will reconnect automatically – when the mains power returns to normal. Re-connection takes place after a delay ('the start-up delay') to ensure stability of the mains.

The AVS detects the mains voltage, whether high or low, to prevent danger to the equipment. When the power supply has returned to normal, the AVS waits before the power supply is restored to your equipment.

When equipment suffers from high/low voltage, power back/spike surges or loss of neutral, the AVS detects the condition and disconnects the power to the equipment to protect against it.

The AVS30 helps protect and prolong the longevity of solar inverters, eliminates the need to switch off appliances every time the electricity fails and safeguards valuable electrical appliances.

Enquiries: sales@sollatek.co.za or www.sollatek.com





START SMALL. AIM BIG. ACHIEVE YOUR DREAM

Any electrical contractor can take his or her business to the next level. Starting out is often a journey of learning as you discover how to work with clients, what areas of the industry you enjoy the most, and identifying the gaps where you think you can grow. It takes hard work, determination, an attitude of constant learning, and the ability to build relationships. Collaborating with other people and organisations is key to your success as they can help you to build your network, expand your horizons, and learn more about your business.

"Start small but think big," says Carel Scheepers, General Manager: Sales at Citiq Prepaid. "There is so much opportunity for electrical contractors who are willing to expand their horizons and find new ways of working. You just need to have a vision of what you would like your business to look like and a platform from which to start."

Citiq Prepaid has worked closely with numerous small businesses over the years. Two of them – Go Go Green Electrical and ARK Electrical – have already felt the benefits of working with the company. Go Go Green Electrical started out as a small husband and wife team and is now working closely with Citiq Prepaid to expand its sub-metering offering into the townships. This move has not only supported the growth of the company, but has helped them with their vision of giving back to their community.

"Citiq Prepaid were unbelievably willing to help us," says Tebogo Mabena, co-founder of Go Go Green Electrical. "They offered to brand our bakkie, which has helped bring us a lot of customers, and they gave us marketing materials to use in collaboration with them as we work with townships and malls. They provide exceptional support, always call us back, and really are just easier to work with overall."

For Mabena, Citiq Prepaid's lower service fees and the accessibility of the electricity tokens for the meters were huge advantages. It meant that he had less admin and happier customers. Citiq Prepaid prides itself on helping contractors build their companies and take them to the next level. On top of providing branding, support and accessible sub-metering solutions, Citiq Prepaid runs the Citiq Installation Club (CIC). An industry first, this loyalty programme

rewards contractors for their hard work.

"The CIC is designed to recognise the hard work that electrical contractors put into their jobs, every single day," says Scheepers. "It also provides financial rewards to contractors through a points system – once they get 20 points, they receive a R500 voucher to spend at their preferred wholesaler or retailer."

Citiq Prepaid recognises the hard work that goes into building a business and has structured its portfolio to be as admin friendly as possible. After all, nobody likes admin. The company ensures that contractors who partner with them are provided with support, information, guidance,

ongoing learning, opportunities, and reliable products. Every aspect of the company is driven by people, relationships and quality.

"We believe in empowering the people who work with us," concludes Scheepers. "Not only have we helped build Go Go Green Electrical, but we've worked with ARK Electrical on a project that has transformed a development and reshaped the way its tenants managed their power."

Find out next month how Citiq Prepaid and ARK Electrical built the electrical backbone of a development in Port Elizabeth.

Enquiries: www.citiqprepaid.co.za



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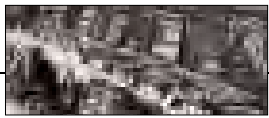
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THE SMART TOOLS MAKING CONSTRUCTION MORE ECONOMIC

More efficient. More productive. Working at ever-increasing speeds with no loss of precision. These are the challenges that construction companies face today. At the same time, planning and execution are becoming increasingly complex. To address these challenges, the construction industry is progressively integrating more digital solutions with the declared goal of implementing lean construction. The nucleus, where all the construction data is stored, is BIM (Building Information Modelling). New digital solutions designed to boost the industry's profitability on the basis of BIM are gradually emerging on the market. These four smart tools developed by Doka in cooperation with its customers illustrate what this can look like in practice.

As the 2019 bauma construction trade fair clearly showed, construction sites are becoming increasingly digital and more and more processes are being automated, from planning and execution to building management. The focus here is not on isolated solutions, but on a holistic network of integrated systems and applications that interact and effectively 'communicate' with each other (Internet of Things, or IoT). This allows important but time-consuming and sometimes error-prone processes to be streamlined and simultaneously made more precise and transparent – including documentation.

The solutions must not only be practical, however, but user-friendly and customer-oriented as well. There is no way they will become established and

generate real added value unless they are developed with the everyday working routines in mind, without requiring lengthy technical training. This is why Doka has worked with its customers to develop a wide range of digital solutions designed to tackle the construction industry's most common "gripes" in planning and implementing a project and to help it work more economically.

Precise daily cycle planning, clear assignment of tasks and target-performance comparisons

A cyclist's performance is measured in watts. Soccer players are ranked on the basis of their passing accuracy scores and the number of kilometres they have run. This kind of performance monitoring and measurement has also been around for some time in the manufacturing industry, in the automotive sector, for example. Be it sports or industry, the principle is the same: sensors are used to collect data and analyse how performance might be improved. Kontakt, a start-up subsidiary of Umdasch Group Ventures, has applied this principle to construction: live field data from the construction site, supplied by the foreman or supervisor on the one hand and formwork sensors on the other, is collected in the Kontakt platform and ultimately also fed back into the BIM model as actual performance data. This documents the percentage of completion on the construction site (target-performance comparison) comprehensively and in real time, thus establishing a valuable database for analysing how productive the construction site was and how performance

might be enhanced. In addition, Kontakt facilitates clearly structured digital cycle planning and allows work steps to be flexibly adapted to real conditions and tasks to be assigned specifically to the person or persons responsible. This is what it looks like in practice: The cycles are planned on your desktop computer via Kontakt, using the BIM model. The details are confirmed by the foreman or supervisor, who then receives information on the individual tasks and responsibilities on a smartphone, allowing them to check at any time how well the team is progressing or where they may have encountered difficulties. Potential areas for improvement can be quickly analysed on the basis of the measured data both during the construction phase and after completion.

Using Remote Instructor to spirit a virtual expert onto the construction site

While some work steps and processes can be automated or digitalised to good effect, there is no substitute for the support of well-trained specialists on location. But what if a problem crops up, brings the construction site to a standstill, and no qualified personnel are at hand to solve the problem? Now, one possible solution is the Remote Instructor. This software sets up a video link to an expert and allows you to virtually spirit them to your construction site on any device, for example by sharing your screen or camera view. This saves time and money, as employees can consult (internal or external) specialists without them having to travel to the site. Problems can be solved, formwork plans discussed, and product applications



explained, regardless of location.

These applications and more have the goal of streamlining workflows, improving clarity and boosting execution quality. "Construction companies still spend a large part of their time on the construction site on activities that do not drive progress. Our digital services are designed to help our customers work more flexibly and efficiently, thus enhancing their competitiveness", says Stefan Pruckmayr, Head of the Digital Services business unit at Doka. "Of course, each solution can be used individually. But things get interesting when they interact by networking and linking the data. This is the real driving force for increasing performance around the construction site."

Enquiries: www.doka.com

NON-CONTACT VOLTAGE DETECTOR FOR ELECTRICAL INSTALLATIONS

The Flir VP40, a non-contact voltage detector for use in North America designed for field-troubleshooting and verification of residential, commercial, and industrial electrical installations. The VP40 makes it easy to quickly troubleshoot live and neutral wiring to ensure a safe job site.

With its built-in flashlight and CAT IV safety rating, the Flir VP40 is a must-have for preliminary job site checks for live wiring. The durable, pen-sized tester quickly identifies the presence of ac voltage without contacting wires, even in the latest safety outlets. The VP40 simplifies wire identification by sorting and tracing neutral and live wires in sockets and junction boxes.

Inspired by today's smartphones, the VP40 uses both multi-coloured LEDs and vibration to alert electrical contractors of live voltage, ensuring inspectors do not miss these notifications in loud or dark locations. The durable tester is built for longevity, with an anti-roll case body and rugged construction that can withstand a 3 m onto concrete. Every VP40 is also protected by Flir's three-year warranty.

Enquiries: www.flir.com



AC CURRENT CLAMP METER WITH DATA LOGGER

The MT745 from Major Tech is a clamp meter used to measure the ac current running through an electrical conductor in tight spaces. It permits electricians to measure the current without touching the conductor or having to disconnect the supply from the conductor.

The MT745 includes a large backlit LCD display to make it easy to read the measurement, which can be in the range of 0.5 A to 3 000 A. Pressing the 'hold' button on the current meter will keep the latest readings on the screen, while the built-in Bluetooth communication allows users to send data to the Meterbox app on their smartphones.

The device has a sample time of 200 milliseconds. The data logger keeps 16 320 measurements, and users are presented with an analogue bar graph, and can also view the frequency and inrush current. The MT745 uses two LR6 batteries and to save power the instrument will automatically power down after 15 minutes of inactivity.

The flexible current coil is 457 mm in length. The Meterbox Pro app is available for Android and iOS smartphones at no charge.

Enquiries: sales@major-tech.com



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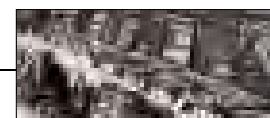
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NEW QUICK DRAW PRECISION MARKING TAPES

Never look for a pencil again or a rule; imagine pulling the tape out and instantly making your mark. Quickdraw rolls a graphite line automatically, with greater accuracy than a pencil, and is easily operated with one hand, thanks to the patented RollMark™ Graphite Technology. Two models are available in South Africa; a 5 m and 8 m tape.



QuickDraw uses 0.9 mm graphite sticks, (10 sticks are included in each

pack) and can be reloaded in less than 10 seconds. QD Graphite refills are also available. Lock the blade to draw circles and lines or a radius and hold the corner of the hook on the centre point.

The marking system works as follows; there is a stick of graphite directly above the small steel wheel. As the wheel rolls, it transfers the graphite to the surface being marked. It works on all kinds of surfaces, no matter how rough, because the mark is made by a small hardened steel wheel, which rolls out the graphite. The result is a pencil line, without the pencil, and it never needs to be sharpened. A white refill marker is also available as an extra accessory.

The marking system acts as a gun site, eliminating the parallax effect and letting you make an extremely accurate

mark. The rugged co-moulded case is secured by industrial STAR-drive screws. The tape hook is secured with three rivets and a steel backing plate and you can extend the stand-out of the blade up to 140 cm plus with your free hand.

The self-marking QuickDraw tape measure makes 2000+ marks per load. Reloading takes only seconds, and your tape comes with 10 refills that will make over 20 000 marks. The tape also includes a hook/clip that can be attached to your belt or toolbox (a key chain option is also available as an extra accessory).

The awards and reports have flowed in for the new QuickDraw tape measure after it was introduced in the USA. Construction Home Depot rated the QuickDraw marking tape measure as the top tape measure, while Dane Scarborough,

the leading tool guru in the USA, noted that it is, "the best tape measure ever".

"If you work with a tape measure every day, or just once in a while on a home project, you will love the new innovation of the QuickDraw self-marking tape measure," says Ryan Hunt, Sales and Marketing Director Vermont Sales. "It makes a perfect circle, or half circle, gives you an extra hand to hold the blade in place for a more accurate mark, duplicates measurements easily, makes difficult measurements easy, saves time and frustration by never having to look for a pencil or a sharpener again and comes with 10 refills. The QuickDraw is built to meet the toughest demands of the professional contractor," he says.

Enquiries: +27 (0)11 314 7711

ACCURATE, RELIABLE RESULTS WITH THERMAL CAMERA

Leading an industrial maintenance team requires a combination of communication skills, industry knowledge and technical expertise. Implementing standard work and a preventive maintenance programme is more than just good for business – it also aligns the team with a common goal of safely and efficiently keeping the plant up and running. Choosing the right tools can make a significant difference in the success of these types of programs. Comtest is pleased to announce Fluke's new Ti300+ infrared camera for reducing unexpected breakdowns and improving work execution by helping maintenance teams to find issues before they become problems. The Ti300+ has the resolution and accuracy needed to clearly reveal temperature differentials or demonstrate progressive heat changes over time.

With LaserSharp™ AutoFocus the Ti300+ ensures focused images, every single time. With the touch of a button, the built-in laser distance meter calculates and displays the distance to the designated target on the camera screen and takes the image in focus. Most importantly, temperature readings from in-focus images are highly accurate. The Ti300+ enables the team to get clear images with touchscreen simplicity, while maintaining a safer distance from operating equipment. Features include:

- 320 x 240 resolution.
- Measures up to 650 °C.

- Engineered and tested to withstand a 2 m drop.
- Manual or automatic focus.

In conjunction with Fluke Connect desktop software for connectivity, the Ti300+ is able to generate professional reports in minutes, while efficiently capturing full radiometric data to support the maintenance program.

- Edit and optimise images.
- Combine infrared and visible images for simpler analysis.
- Create detailed reports.
- Access thermal images from cloud storage.
- Organise and search images by asset, severity and title.

For thermal images to illustrate an issue, users need to know the equipment and understand the subtle difference between normal and abnormal operating temperatures. Also, confidence in the ability to capture accurate thermal images plays a significant part, and having a Fluke Ti300+ thermal camera with LaserSharp AutoFocus makes taking everything much easier. Finally, users need a thermal camera that is rugged enough to capture quality infrared images even if it gets dropped (up to two metres).

Enquiries: +27 (0)10 595 1821



HIGH DEFINITION OSCILLOSCOPE MAXIMISES PERFORMANCE AND VALUE

The WaveSurfer 4000HD High Definition Oscilloscope (HDO) from Teledyne LeCroy is the first in its class to feature 12-bit vertical resolution at all times, showing clean, crisp waveforms on a bright, 12.1" touch screen display. WaveSurfer 4000HD is available in bandwidths from 200 MHz to 1 GHz, with sample rates of up to 5 GS/s and up to 12.5 Mpts of acquisition memory on each channel (25 Mpts interleaved). It offers versatile built-in capabilities for embedded systems debug and is compatible with Teledyne LeCroy's comprehensive probe offerings.

Design and test engineers have come to demand the signal detail and measurement accuracy that comes with a 12-bit HDO when debugging deeply-embedded systems in IoT, automotive, switch-mode power supply and other control system designs. Other oscilloscope manufacturers make claims of 10-bit or 12-bit resolution, but their oscilloscopes lack low-noise and low-jitter components throughout their acquisition system and require tradeoffs of channel count, bandwidth or sample rate to achieve high resolution and lower noise.

The WaveSurfer 4000HD answers the call as a highly affordable instrument that leverages Teledyne LeCroy's HD4096 High Definition technology to deliver 12-bit resolution all the time. HD4096 technology utilises a system design of high signal-to-noise input amplifiers, high sample rate 12-bit ADCs, and a low-noise system architecture to enable capture and display of waveforms with 16x more resolution than 8-bit oscilloscopes. WaveSurfer 4000HD delivers the best performance in its class, demonstrating the lowest baseline noise – 2.5 times better than competitive oscilloscopes with 12-bit ADCs and eight times better than competitive oscilloscopes with 10-bit ADCs

– and highest accuracy – 0.5% versus competitors' 2.5% at 1 mV/div gain setting. Displayed waveforms are crisper, cleaner and provide visibility into signal details that are often lost in the noise on other oscilloscopes, including those with advertised 10-bit and 12-bit ADCs.

WaveSurfer 4000HD further increases its value by integrating multiple instruments into one and reducing clutter on the test bench: it offers an optional 16-channel Mixed-Signal Oscilloscope (MSO), Arbitrary Waveform Generator (AWG), Frequency Counter and Spectrum Analyzer (available early 2020).

Enquiries: www.teledynelcroy.com



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300 KHZ TO 200 MHZ ANTENNA AND CABLE ANALYSER



BIRD TECHNOLOGIES, a provider of RF components, subsystems, test equipment, and services, and represented locally by COMTEST Solutions, is offering the SiteHawk SK-200-TC, a hand-held antenna and cable analyser that operates between 300 kHz and 200 MHz. The instrument simplifies detection of problems in coaxial transmission lines and antenna systems, and pinpoints their source using distance-to-fault measurements.

The SiteHawk SK-200-TC provides all the measurement capabilities required to evaluate the performance of a communication system's transmission path, and has the same features as its higher-frequency counterpart, Bird's SiteHawk SK-4000-TC, which operates over a frequency range of 85 MHz to 4000 MHz. The SiteHawk SK-200-TC is a rugged, compact instrument – measuring only 18.2 x 9.6 x 4.8 cm and weighing 900 g – that is easy for novices and veterans

alike to use. It has an intuitive user interface displayed on its high-resolution TFT LCD colour display that is readable in bright sunlight, and has 16 GB of internal flash memory for storing thousands of traces and measurement setups.

The distance-to-fault measurement indicates VSWR or return loss at various points from the beginning of the transmission line all the way to the antenna and identifies the location of a problem with high resolution. The cable loss function measures insertion loss of the transmission line over a given frequency range.

The instrument makes fast swept measurements at up to 0.25 ms per data point of return loss and cable loss as well as VSWR and distance to fault, and allows users to set trace capture using 51, 101, 201, 401, 801, 1601 or 3201 data points per sweep. Both X and Y scales as well as measurement units can be changed by the user

as can a pass-fail limit with visual indicator for quick 'go/no-go' indications. There are six user-selectable markers for direct or difference measurements that can be referenced to the limit line or a recalled trace. A measurement-hold feature also allows a trace to be stored temporarily for analysis.

Enquiries: +27 (0)10 595 1821

PORTABLE VIBRATION METER STORES UP TO 100 READINGS



INSTROTECH, local representative of Monitran, is introducing an upgraded version of its successful portable vibration meter with a bright, easily readable display. When connected to a constant current type accelerometer the compact MTN/VM330D stores up to 100 time-stamped readings, which can be transferred to a PC using the USB cable supplied.

An invaluable trouble-shooting tool, the high performance unit displays an instant readout of RMS, peak, peak-peak, crest factor and bearing condition and gives a colour-coded indication of machine status.

Conforming to ISO 10816-3, it has a large colour LCD display and a rugged protective rubber case. Its rechargeable lithium-ion battery comes with a worldwide charger and delivers a battery life of over 20 hours. Other features include a switchable low pass filter and an audio output for listening to the vibration directly.

The MTN/VM330D is suitable for monitoring the performance of a wide range of machinery, including engines, gearboxes, motors, turbines and pumps. It is supplied with Monitran's MTN/2200 general purpose accelerometer as standard, with other types available on request.

"This simple vibration meter gives you the ability to measure vibration at any point on a machine and is often all you need to confirm that your machinery is working within manufacturing specification. We recommend it should be in every engineer's tool kit," said Monitran managing director Andy Anthony.

Customers who already have Monitran's MTN/VM220 vibration meter can return it to take advantage of an introductory upgrade offer.

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FOUR KEY FACTORS TO CONSIDER WHEN CHOOSING DEVICES FOR THE CONTROL CABINET

Control cabinets play a vital role in monitoring and controlling industrial applications. To ensure system uptime, system integrators should consider several key factors when choosing devices for control cabinets that need to perform optimally and reliably for the next 10-15 years.

Drawing from over 30 years of experience in providing reliable products for industrial control cabinets, Moxa has identified the following four key considerations for choosing the best control cabinet devices for mission-critical applications:

1. Withstand harsh environments

Control cabinets can be placed in a variety of environments, both indoors and outdoors. Depending on the specific project requirements, the devices used in the cabinet should feature a wide operating temperature range and specific certifications for use in hazardous locations, such as C1D2 (US) or ATEX (EU) certifications for oil and gas applications, or DNV GL certification for marine applications.

2. Efficient use of space

Control cabinets are often added to an existing infrastructure or placed alongside machine tools used to enable remote monitoring and control. Consequently, the devices inside should be as compact as possible. In addition, thermal management of electronic equipment also requires additional space and an adequate 'keep-out-zone' to ensure safe and reliable operation. A good way to save space is to choose integrated (all-in-one) devices, such as a computer with a rich interface set and wireless capabilities, or a device server with integrated I/Os or switches.

3. Easy hardware installation and maintenance

Control cabinets have a limited amount of physical space to accommodate a high volume of industrial control units, switching blocks, wiring, and other equipment. Devices with DIN-rail mounting capabilities save installation time, reduce wiring connection costs and effort, provide easy component adjustments, arrangements and maintenance, as well as supporting high-density deployment.

4. Power consumption and redundancy

Due to different use cases, the control cabinet may be situated in places with limited power supply, or even only rely on batteries. Consequently, it is important to choose devices with relatively low power consumption. At the same time, these devices must still have the operational reliability to ensure the efficiency of a functioning cabinet. Depending on the project specifications the cabinet may even require a redundant power supply to guarantee power stability, uptime reliability and a wide range to overcome power fluctuation demands.

Recommendations from Moxa include the NPort IA5000A serial device servers; MGate MB3170/MB3270 Modbus TCP gateways; ioLogik E1200 remote I/O; and IMC-21A Ethernet-to-fiber media converters.

NPort IA5000A

The NPort IA5000A device servers are designed for connecting industrial automation serial devices, such as PLCs, sensors, meters, motors, drives, barcode readers and operator displays. The devices are solidly built, come in a metal housing with screw connectors, and provide full surge protection. The NPort IA5000A servers are extremely user-friendly, making simple and reliable serial-to-Ethernet solutions possible.

Each unit has two Ethernet ports that can be used as Ethernet switch ports. One port connects directly to the network or server, and the other can be connected to either another NPort IA device server or another Ethernet device. The dual Ethernet ports help reduce wiring costs by eliminating the need to connect each device to a separate Ethernet switch.

MGate MB3170/MB3270

The MGate MB3170 and MB3270 are 1 and 2-port Modbus gateways, respectively, which convert between Modbus TCP, ASCII, and RTU communications protocols. The gateways provide both serial-to-Ethernet communication and serial (master) to serial (slave) communications. In addition, the gateways support simultaneously connecting serial and Ethernet masters with serial Modbus devices. The gateways can be accessed by up to 32 TCP master/clients or connect to up to 32 TCP slave/servers. Routing through the serial ports can be controlled by IP address, TCP port number, or ID mapping. A featured priority control function allows urgent commands to obtain an immediate response. All models are rugged, DIN-rail mountable, and offer optional built-in optical isolation for serial signals.

ioLogik E1200

The ioLogik E1200 Series supports the most often-used protocols for retrieving I/O data, making it capable of handling a wide variety of applications. Most IT engineers use SNMP or RESTful API protocols, but OT engineers are more familiar with OT-based protocols, such as Modbus and EtherNet/IP. Moxa's Smart I/O makes it possible for both IT and OT engineers to conveniently retrieve data from the same I/O device. The ioLogik E1200 Series speaks six different protocols, including Modbus TCP, EtherNet/IP, and Moxa AOPC for OT engineers, as well as SNMP, RESTful API, and Moxa MXIO library for IT engineers.

The ioLogik E1200 retrieves I/O data and converts the data to



any of these protocols at the same time, allowing users to get your applications connected easily and effortlessly.

The UC-8100 computing platform is designed for embedded data-acquisition applications. The computer comes with one or two RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports, as well as a mini PCIe slot to support cellular modules. These versatile communication capabilities let users efficiently adapt it to a variety of complex communications solutions. Each unit is built around a Cortex-A8 RISC processor that has been optimised for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With flexible interfacing options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform for many other large-scale deployments.

IMC-21A

The IMC-21A industrial media converters are entry-level 10/100BaseT(X)-to-100BaseFX media converters designed to provide reliable and stable operation in harsh industrial environments. The converters can operate reliably in temperatures ranging from -40 to 75°C. The rugged hardware design ensures that all Ethernet equipment can withstand demanding industrial conditions. The IMC-21A converters are easy to mount on a DIN rail or in distribution boxes.

Enquiries: +27 (0)11 781 0777

A NEW INNOVATIVE ADAPTOR

Answering to the call by Industry 4.0, Rittal's Blue e cooling units can now integrate into existing condition monitoring and IIoT systems thanks to a special adaptor that retrofits comprehensive communications capabilities.

Higher system availability

The new adaptor can be used to set up condition monitoring for up to 10 cooling units in a master/slave arrangement. That means not only can data be recorded, but efficiency analyses can also be carried out on the cooling solution. A monitoring system that issues automatic notifications can also be set up to detect faults and limit breaches, thereby helping boost availability and prevent expensive machine downtime.

The new adapter is compatible with all Blue e units that use a Comfort Controller and both wall and roof-mounted cooling units can be made fit for Industry 4.0. This applies to both

standard units and stainless steel versions. Similarly, Rittal cooling units with a NEMA 3R/4 or NEMA 4X classification – which are often used outdoors – are ideally suited for incorporation into IIoT applications. Typical examples of outdoor applications for these units include renewable energy facilities such as solar and wind power plants. As these plants are usually located in isolated areas, it is essential that they incorporate remote monitoring for panel building and switchgear manufacturing.

Straightforward commissioning

Rittal has developed the new IIoT adaptor because the older Blue e units cannot communicate directly with the IIoT interface. The whole system can be configured and commissioned via the web server integrated into the IIoT interface – quickly, conveniently and without the need for any programming.

Enquiries: +27 (0)11 609 8294

AVAILABILITY OF INTERCONNECTION SOLUTIONS FROM HARTING



RS COMPONENTS has extended its industrial connector portfolio with new solutions from HARTING, including the recently launched Han 1A connector.

The new Han 1A is a significantly smaller connector than the Han 3A, requiring 30% less space than the manufacturer's previous smallest rectangular industrial connector. The unit has been developed to meet the demand for smaller interfaces used with the latest power engineering equipment deployed in modern networks.

A key feature of the connector is its versatility, which enables the easy creation of simple interfaces. It has a system of modular inserts and is constructed from a lightweight and durable polyamide plastic, making it suitable for a wide range of applications. In addition, the Han 1A uses the simple 'click and mate' system and provides a solution for on-site installation with screw contacts or for the pre-assembly of separate units with crimp contacts.

The connector integrates contacts for data, power and signal transmission: it has modules available for

Cat 5 or 6 A data transmission; it can handle a maximum of 16 A and 400 V; and has up to 12 D-sub contacts for signal interfaces. In addition, there is a shielded version for application environments that are susceptible to interference.

Overall, it provides an efficient solution for applications such as heating and cooling units, fans, control terminals, lighting systems, drives and vibration conveyors. It also meets the EN45545-2 standard for fire protection on railway vehicles, making it well suited for use on a variety of systems including door openers, lighting and screens. Accessories are also available, such as fasteners for wall mounting or colour-coded pins to help in the identification of signal lines. The use of additional housing elements or single-wire seals can also extend protection up to IP65, making it suitable for use in outdoor environments.

Enquiries: +27 (0)11 691 9300





MANUFACTURERS	CONTACTS	OUTDOOR DECORATIVE LIGHTING	FLAMEPROOF/HAZARDOUS AREA LIGHTING
<p>ABB South Africa Aurora Lighting Ausma BEKA Schröder Eaton Electric Electroweb HellermannTyton Genlux Lighting Krilux LEDVANCE Legrand Matelec Nordland Lighting Shuttle Lighting Control Systems Spazio Lighting Superlume Visionware</p>	<p>Nordland Lighting Johann Lamprecht Power Panels and Electrical Freddie Radiant Group Alfred Weldon Shuttle Lighting Control Systems Tracey Smith Spazio Lighting Sales Superlume Willie Garbers Unique Lighting Michael Smith Visionware Werner Benade Voltex Hugh Ward Voltex Lighting Mark Storer/Mark Rudman Voltex Smart Solutions Juanita Kanagan Waco Jaco Coetzee</p>	<p>Electrahertz Full range of outdoor decorative lighting Electroweb Full range of outdoor decorative lighting Eurolux Bulkheads, outdoor lights, flood and security lights Genlux Lighting Outdoor lights; bulkheads; flood and security lights; solar lights Khanyisa Full range of outdoor decorative lighting Krilux PAR38 LED colour lamps available (red, blue, green, yellow) Lamps Electrical Distributor Full range of outdoor decorative lighting LEDVANCE Full range of outdoor decorative lighting Legrand Weatherproof and vandal resistant bulkhead lights Major Tech Full range of LED garden lights, wall lights ideal for office, home and hotels Matelec Centurion Bulkheads (LED, CFL); Mirage Bulkheads (LED, CFL); PAR 38 (single and double) MCE Electric O-lite outdoor LED aluminium fittings; O-lite outdoor E27 aluminium fittings; O-lite outdoor recessed step light; O-Lite bulkhead fittings Megalight Electrical Full range of outdoor decorative lighting Nordland Lighting Full range of outdoor decorative lighting Power Panels and Electrical Full range of outdoor decorative lighting Radiant Group Full range of outdoor decorative lighting Spazio Lighting Full range of outdoor decorative lighting Superlume A wide of range of decorative outdoor lighting – SKY-ESL-06 Unique Lighting Full range of outdoor decorative lighting Visionware Full range of outdoor decorative lighting Voltex Solar street lights, flood lights, bulkheads, sensor lights with conventional control gears; energy efficient and LED Voltex Lighting Solar street lights, flood lights, bulkheads, sensor lights with conventional control gears; energy efficient and LED Waco Solar street lights, flood lights, bulkheads, sensor lights with conventional control gears; energy efficient and LED</p>	<p>Atlas Group Distributors of Zone 1, 2 and 22 specialised lighting for indoor and outdoor BEKA Schröder Full range of flameproof/hazardous area lighting Bellico Distributors of Zone 1, 2 and 22 specialised lighting for indoor and outdoor Citilec Full range of flameproof/hazardous area lighting Eaton Electric Full range of flameproof/hazardous area lighting Electrahertz Full range of flameproof/hazardous area lighting Genlux Lighting Full range of flameproof/hazardous area lighting Khanyisa Full range of flameproof/hazardous area lighting Lamps Electrical Distributor Full range of flameproof/hazardous area lighting Matelec Norland agent for Western Cape MCE Electric O-lite LED floodlights Megalight Electrical Full range of floodlights Nordland Lighting Full range of flameproof/hazardous area lighting Power Panels and Electrical Full range of flameproof/hazardous area lighting Superlume Zone rated fittings Unique Lighting Full range of flameproof/hazardous area lighting Visionware Full range of flameproof/hazardous area lighting Voltex Distributors of Zone 1, 2 and 22 specialised lighting for indoor and outdoor Voltex Lighting Distributors of Zone 1, 2 and 22 specialised lighting for indoor and outdoor</p>
DISTRIBUTORS	INDOOR DECORATIVE LIGHTING	EMERGENCY LIGHTING	ENTERTAINMENT LIGHTING
<p>ACDC Dynamics Aberdare Cables ACTOM Electrical Products ARB Electrical Wholesalers Atlas Group Aurora Lighting Ausma BEKA Schröder Bellico Citilec Crabtree South Africa Denver Technical Products Eaton Electric Electrahertz ElectroMechanica Electroweb Eurolux Genlux Lighting HellermannTyton Khanyisa Lamps Electrical Distributor LS Lighting Structures Lumax Lighting Major Tech Matelec MCE Electric Megalight Electrical Power Panels and Electrical Radiant Group Spazio Lighting Superlume Unique Lighting Voltex Voltex Lighting Voltex Smart Solutions Waco</p>	<p>ACDC Dynamics Full range of indoor decorative lighting: LED, LED glare-reducing and standard CFL options – downlights, chandeliers, wall mounts, spotlights, LED strip lights, wall washer LEDs, stainless steel light fittings ACTOM Electrical Products Distributors of Rabro brand imported and local manufactured product ARB Electrical Wholesalers Full range of indoor decorative lighting Atlas Group Distributor of a wide variety of reputable brands, designs and specifications eg energy saving and LED Aurora Lighting Aurora Lighting and Enlite Lighting indoor decorative lighting Ausma Full range of indoor decorative lighting BEKA Schröder Full range of indoor decorative lighting luminaires Bellico Distributor of a wide variety of reputable brands, designs and specifications eg energy saving and LED Citilec Full range of indoor decorative lighting Crabtree South Africa Acrylic diffuser with conical light control prisms (single; double – new Econo narrow body; and wide body decorative) Electrahertz Full range of indoor decorative lighting Electroweb Full range of indoor decorative lighting Eurolux Downlights, chandeliers, ceiling lights, spotlights, pendant lights, table lights, floor lights, fans, wall lights Genlux Lighting Full range of indoor decorative lighting Khanyisa Full range of indoor decorative lighting Krilux Extensive range of LED filament lamps available (G125, G95, ST64, PEAR, A60, C37, G45) Lamps Electrical Distributor Full range of indoor decorative lighting LEDVANCE Full range of indoor decorative lighting Lumax Lighting Full range of indoor decorative lighting Major Tech Full range of LED wall lights, picture and mirror lights, step lights and ceiling lights ideal for office, home, hotels and general lighting applications MCE Electric O-lite LED candle bulbs, globes and lamps; O-Lite LED Cyclops panel lights; O-Lite LED downlights with built-in drivers Megalight Electrical Full range of indoor decorative lighting Power Panels and Electrical Full range of indoor decorative lighting Radiant Group Full range of indoor decorative lighting Shuttle Lighting Control Systems Control systems for dimming of LED, halogen and incandescent lamps Spazio Lighting Full range of indoor decorative lighting Superlume A wide range of decorative indoor lighting – new RZD300 Unique Lighting Full range of indoor decorative lighting Visionware Full range of indoor decorative lighting Voltex Distributor of a wide variety of reputable brands, designs and specifications eg energy saving and LED Voltex Lighting Distributor of a wide variety of reputable brands, designs and specifications eg energy saving and LED Waco Distributor of a wide variety of reputable brands, designs and specifications, for example, energy saving and LED</p>	<p>ABB South Africa Full range of emergency lighting ACDC Dynamics Full range of emergency lighting: wall mount, double-sided, legends, bulkhead and Eco Lights ranging from IP42 to IP65 ARB Electrical Wholesalers Full range of emergency lighting Atlas Group Distributors of Voltex lighting: emergency and other signs; emergency control gear for fluorescent lights as specified in the OHS Act Aurora Lighting Full range of emergency lighting Ausma Full range of emergency lighting BEKA Schröder Full range of emergency lighting Bellico Distributors of Voltex lighting: emergency and other signs; emergency control gear for fluorescent lights as specified in the OHS Act Citilec Full range of emergency lighting Denver Technical Products Mains fail safety lighting; track mounted lights Eaton Electric Full range of emergency lighting Electrahertz Full range of emergency lighting Electroweb Full range of emergency lighting Eurolux LED emergency lights; rechargeable portable emergency lights Genlux Lighting Full range of emergency lighting Khanyisa Full range of emergency lighting Legrand Full range of emergency lighting units ranging from fluorescent to LED including maintained and non-maintained Major Tech Full range of portable lighting – in LED and fluorescent – ideal for power outages, camping, fishing, hiking, hotel, office and warehouse applications Megalight Electrical Full range of emergency lighting Nordland Lighting Full range of emergency lighting Power Panels and Electrical Full range of emergency lighting Radiant Group Full range of emergency lighting Spazio Lighting Full range of emergency lighting Superlume A wide range of emergency lighting – ELX233L Unique Lighting Full range of emergency lighting Visionware Full range of emergency lighting Voltex Distributors of Voltex lighting: emergency and other signs; emergency control gear for fluorescent lights as specified in the OHS Act Voltex Lighting Distributors of Voltex lighting: emergency and other signs; emergency control gear for fluorescent lights as specified in the OHS Act Waco Distributors of Voltex lighting: emergency and other signs; emergency control gear for fluorescent lights as specified in the OHS Act</p>	<p>ACDC Dynamics Full range of entertainment lighting: flexible and rigid LED strip lighting, LED bar lights (IP65), LED border lights (IP65), disco lights, stage flood lights, lasers and mini laser lights, colour changing LED strip lights, high power LED lights and various Christmas/festive lighting ACTOM Electrical Products Distributors of Opple and OSRAM brand entertainment lighting ARB Electrical Wholesalers Full range of entertainment lighting Atlas Group Available on request, eg spotlights, follow spots and strobe lights Aurora Lighting Aurora Lighting and Enlite Lighting entertainment lighting Bellico Available on request, eg spotlights, follow spots and strobe lights Electrahertz Full range of entertainment lighting Genlux Lighting Full range of entertainment lighting Khanyisa Full range of entertainment lighting MCE Electric O-lite LED strip and rope lights; O-lite LED plinth, cabinet and reading lights Megalight Electrical Full range of entertainment lighting Power Panels and Electrical Full range of entertainment lighting Radiant Group Full range of entertainment lighting Voltex Available on request, eg spotlights, follow spots and strobe lights</p>
CONTACTS	OUTDOOR DECORATIVE LIGHTING	FLAMEPROOF/HAZARDOUS AREA LIGHTING	STREET LIGHTING
<p>ABB South Africa Claudeen Forbes Aberdare Cables Jyoshtie Dhunes ACDC Dynamics Elmari Erasmus/Dirk Klynsmith ACTOM Electrical Products Millicent Mabote ARB Electrical Wholesalers Sales Atlas Group Annie Storar/Imran Gaffoor Aurora Lighting Alan de Kocks Ausma Ares BEKA Schröder Grant Combrink Bellico Shiraj Wentzel Citilec Geoffrey Bower Crabtree South Africa Sales Denver Technical Products Mervyn Stocks Eaton Electric Marlene Coetzee Eurolux Sales Electrahertz Frank Proude (Pta) Peet Lourens (Jhb) ElectraMechanica Vinson Moore Electroweb Deon van Vuuren Genlux Lighting Glen Hill HellermannTyton Andrew Edwards Khanyisa Dominic Kalil Krilux Krisem Lamps Electrical Distributor Shaun LEDVANCE LEDVANCE Head office Legrand Johan Bosch LS Lighting Structures Juanita Kanagan Lumax Lighting Sales Major Tech Werner Grobbelaar Matelec Yann Leclezio MCE Electric Sales Megalight Electrical Sales</p>	<p>ACDC Dynamics Wide range of outdoor decorative lighting: bulkheads, wall mounts, deck and floor lighting, floodlights, lanterns, garden lights, solar garden lights, security lights, decorative bollards ACTOM Electrical Products Distributors of Genlux brand imported and local manufactured product ARB Electrical Wholesalers Full range of outdoor decorative lighting Atlas Group Solar street lights, flood lights, bulkheads, sensor lights with conventional control gears; energy efficient and LED Ausma Full range of outdoor decorative lighting BEKA Schröder Full range of outdoor decorative lighting Bellico Solar street lights, flood lights, bulkheads, sensor lights with conventional control gears; energy efficient and LED Citilec Full range of outdoor decorative lighting Crabtree South Africa Totally enclosed, high impact, corrosion resistant fluorescent luminaires</p>	<p>ACDC Dynamics Full range of flameproof/hazardous area lighting: visual alarms and beacons ARB Electrical Wholesalers Full range of flameproof/hazardous area lighting</p>	<p>Atlas Group Full range of street lighting: solar lights, LED lights, traffic lights, high power LED street lights (IP65), high power single LED chip lights in die-cast aluminium and Technopolymer ACTOM Electrical Products Distributors Genlux brand imported and local manufactured product ARB Electrical Wholesalers Full range of street lighting luminaires Atlas Group Masts and poles available on request; solar street lights; floodlights; bulkheads; sensor lights with conventional control gear, energy efficient and LED BEKA Schröder Full range of street lighting luminaires Bellico Masts and poles available on request; solar street lights; floodlights; bulkheads; sensor lights with conventional control gear, energy efficient and LED Citilec Full range of street lighting Eaton Electric Full range of street lighting Electrahertz Full range of street lighting Electroweb Full range of street lighting Genlux Lighting Full range of street lighting Khanyisa Full range of street lighting Krilux Full range of HID lamps available (metal halide, HPS, mercury vapour, blended) LS Lighting Structures Masts and poles available on request; solar street lights; floodlights; bulkheads; sensor lights with conventional control gear, energy efficient and LED Lumax Lighting Full range of street lighting luminaires Matelec Nema Photocell Megalight Electrical Full range of street lighting Nordland Lighting Full range of street lighting Power Panels and Electrical Full range of street lighting Superlume A wide range of Solar, HID and LED street-lighting Unique Lighting Full range of street lighting Visionware Full range of street lighting</p>



STREET LIGHTING

Voltex
Full range of street lighting luminaires

Voltex Smart Solutions
Masts and poles available on request; solar street lights; floodlights; bulkheads; sensor lights with conventional control gear, energy efficient and LED

INDUSTRIAL LIGHTING

ACDC Dynamics
Full range of industrial lighting: IP65 highbays, lowbays, bulkheads in aluminium and acrylic, surface-mounted and recessed fluorescent fittings, downlighting

ACTOM Electrical Products
Distributors of imported and local manufactured highbays, lowbays, bulkheads

ARB Electrical Wholesalers
Full range of industrial lighting

Atlas Group
Complete range available; bulkheads, floodlights and weatherproof; energy efficient high bays and low bays

Aurora Lighting
Aurora Lighting and Enlite Lighting industrial lighting

Ausma
Full range of industrial lighting

BEKA Schröder
Full range of industrial lighting luminaires

Bellco
Full range of industrial lighting luminaires

Citilec
Full range of industrial lighting

Crabtree South Africa
Hi-bay luminaires

Denver Technical Products
Mains fail safety lighting

Eaton Electric
Full range of industrial lighting

Electrahertz
Full range of industrial lighting

Electroweb
Full range of industrial lighting

ElectroMechanica
IP65 4 ft Damp Proof and IP65 High Bay

Osram
Ledvance products.

Eurolux
Highbays, HID and PL downlights, recessed and surface-mounted fluorescent fittings

Genlux Lighting
Full range of industrial lighting

Khanyisa
Full range of industrial lighting

Krilux
Full range of HID lamps available (metal halide, HPS, mercury vapour, blended)

LEDVANCE
Full range of industrial lighting

Legrand
Weatherproof bulkhead lights as well as vandal-resistant units

Lumax Lighting
Full range of industrial lighting

Major Tech
Range of high power LED floodlights

Matelec
Zodion Photocell Nema

MCE Electric
O-lite LED floodlights; O-lite LED panel lights; O-lite LED tubes and fittings

Megalight Electrical
Full range of industrial lighting

Nordland Lighting
Full range of industrial lighting luminaires

Power Panels and Electrical
Full range of industrial lighting luminaires

Radiant Group
Full range of industrial lighting luminaires

Spazio Lighting
Full range of industrial lighting

Superlume
Specialists in industrial lighting – LED, HID and fluorescent

Unique Lighting
Full range of industrial lighting luminaires

Visionware
Full range of industrial lighting luminaires

Voltex
Complete range available; bulkheads, floodlights and weatherproof; energy efficient high bays and low bays

Voltex Lighting
Complete range available; bulkheads, floodlights and weatherproof; energy efficient high bays and low bays

OFFICE LIGHTING

Aberdare Cables
Surface decorative fittings – switch start and electronic; recessed – prismatic and low brightness – switch start and electronic

ACDC Dynamics
Full range of office lighting: CFL and LED and high power LED downlights, surface and recess wall lighting; bulkheads; T5 and T8 linear lights, bay lights, glare reducing LED lamps

ACTOM Electrical Products
Distributors of imported and local manufactured downlighters, fluorescent

ARB Electrical Wholesalers
Full range of office lighting luminaires

Atlas Group
Recessed and surface lighting for all applications; energy efficient and LED light sources

Aurora Lighting
Aurora Lighting and Enlite Lighting office lighting

Ausma
Full range of office lighting

BEKA Schröder
Full range of office lighting luminaires

Bellco
Recessed and surface lighting for all applications; energy efficient and LED light sources

Citilec
Full range of office lighting

Denver Technical Products
Mains fail safety lighting

Eaton Electric
Full range of office lighting

Electrahertz
Full range of office lighting

ElectroMechanica
Slim LED Panel 600 x 600 – 15 W Recessed Downlights. Osram Ledvance products.

Eurolux
Highbays, HID and PL downlights, recessed and surface-mounted fluorescent fittings

Genlux Lighting
Full range of office lighting

OFFICE LIGHTING

Khanyisa
Full range of office lighting

Krilux
Full range of LED lamps available (plastic+alu, LED filaments)

Lamps Electrical Distributor
Full range of office lighting

LEDVANCE
Full range of office lighting

Lumax Lighting
Full range of office lighting

Major Tech
Wide range of energy saving LED lighting products

MCE Electric
O-lite LED floodlights; O-lite LED panel lights; O-lite LED tubes and fittings

Megalight Electrical
Full range of office lighting

Power Panels and Electrical
Full range of office lighting

Radiant Group
Full range of office lighting luminaires

Spazio Lighting
Full range of office lighting

Superlume
A wide range of recessed and surface mounted office lighting

Unique Lighting
Full range of office lighting

Visionware
Full range of office lighting

Voltex
Recessed and surface lighting for all applications; energy efficient and LED light sources

Voltex Lighting
Recessed and surface lighting for all applications; energy efficient and LED light sources

Waco
Recessed and surface lighting for all applications; energy efficient and LED light sources

RETAIL LIGHTING

ACDC Dynamics
Full range of retail lighting: downlights, LED flexible and rigid strip lighting, LED track lighting, under-counter LED fittings, LED single modules, light box high power LEDs, LED neon flex lights

ACTOM Electrical Products
Distributors of Oppl LED lighting solutions

ARB Electrical Wholesalers
Full range of retail lighting

Atlas Group
Full range available; troffer fittings; track lights; downlights and spots

Aurora Lighting
Aurora Lighting retail lighting

Ausma
Full range of retail lighting

BEKA Schröder
Full range of retail lighting luminaires

Bellco
Full range available; troffer fittings; track lights; downlights and spots

Citilec
Full range of retail lighting

Denver Technical Products
Mains fail safety lighting

Eaton Electric
Full range of retail lighting

Electrahertz
Full range of retail lighting

Electroweb
Full range of retail lighting

Eurolux
Highbays, HID and PL downlights, recessed and surface-mounted fluorescent fittings

Genlux Lighting
Full range of retail lighting luminaires

Khanyisa
Full range of retail lighting luminaires

Lamps Electrical Distributor
Full range of retail lighting

LEDVANCE
Full range of retail lighting

Lumax Lighting
Full range of retail lighting

Major Tech
Wide range of LED lighting to meet retail applications

Matelec
Gladiator LED utility light (12 W)

MCE Electric
O-lite LED floodlights; O-lite LED panel lights; O-lite LED tubes and fittings

Megalight Electrical
Full range of retail lighting

Power Panels and Electrical
Full range of retail lighting

Radiant Group
Full range of retail lighting

Spazio Lighting
Full range of retail lighting

Superlume
Full range of retail lighting

Unique Lighting
Full range of retail lighting

Visionware
Full range of retail lighting

Voltex
Full range available; troffer fittings; track lights; downlights and spots

Voltex Lighting
Full range available; troffer fittings; track lights; downlights and spots

Waco
Full range available; troffer fittings; track lights; downlights and spots

STADIUM LIGHTING

ACDC Dynamics
Full range of stadium lighting, including Gewiss Horus and Titano floodlights

ACTOM Electrical Products
Distributors of imported and local manufactured product

ARB Electrical Wholesalers
Full range of stadium lighting

Atlas Group
Floodlights; masts; poles for mounting

BEKA Schröder
Full range of stadium lighting luminaires

Bellco
Floodlights; masts; poles for mounting

Crabtree South Africa
All-purpose energy saving floodlights

Eaton Electric
Full range of stadium lighting

Electrahertz
Full range of stadium lighting

STADIUM LIGHTING

Electroweb
Full range of stadium lighting

Genlux Lighting
Full range of stadium lighting

Khanyisa
Full range of stadium lighting

Krilux
Full range of HID lamps available (metal halide, HPS, mercury vapour, blended)

Lamps Electrical Distributor
Full range of stadium lighting

LS Lighting Structures
Floodlights; masts; poles for mounting

Lumax Lighting
Full range of stadium lighting

Major Tech
Range of high power LED floodlights

Nordland Lighting
Full range of stadium lighting

Megalight Electrical
Full range of stadium lighting

Power Panels and Electrical
Full range of stadium lighting

Superlume
A range of stadium floodlights in HID and LED

Unique Lighting
Full range of stadium lighting

Visionware
Full range of stadium lighting

Voltex
Floodlights; masts; poles for mounting

EXHIBITION LIGHTING

ACDC Dynamics
ACDC supports exhibition stand builders with a wide range of lighting, spots, downlighting and floodlights

ACTOM Electrical Products
Distributors of LED lighting solutions

ARB Electrical Wholesalers
Full range of exhibition lighting

Atlas Group
Available on request to customer specifications

Aurora Lighting
Full range of exhibition lighting

Citilec
Full range of exhibition lighting

Eaton Electric
Full range of exhibition lighting

Electrahertz
Full range of exhibition lighting

Electroweb
Full range of exhibition lighting

Eurolux
Highbays, HID and PL downlights, recessed and surface-mounted fluorescent fittings

Genlux Lighting
Full range of exhibition lighting

Khanyisa
Full range of exhibition lighting

Major Tech
Wide range of LED lighting from spotlights, downlighting and floodlights

MCE Electric
O-lite LED floodlights; O-lite LED panel lights; O-lite LED tubes and fittings; O-lite LED downlights; O-lite plinth and cabinet lights

Megalight Electrical
Full range of exhibition lighting

Power Panels and Electrical
Full range of exhibition lighting

Radiant Group
Full range of exhibition lighting

SMART LIGHTING

Aurora Lighting
Full range of smart lighting

BEKA Schröder
Full range of smart lighting

Electrahertz
Full range of smart lighting

Electroweb
Full range of smart lighting

HellermannTyton
Lux meters: T630 – digital lux meter (0-200 000 lux, data hold) T8000- lux meter (LCD display, auto power off)

Khanyisa
Full range of smart lighting

Krilux
A60 and GU10 with built-in day/night sensor function

Matelec
Dimmable 12 W LED bulkhead

Megalight Electrical
Full range of smart lighting

Power Panels and Electrical
Full range of smart lighting

Radiant Group
Full range of smart lighting



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+27 (0)11 874 7600



+27 (0)11 555 5555



+27 (0)11 8796600



+27 (0)12 345 5823



+27 (0)11 662 4300



+27 (0)11 386 0000



BEYOND THE BEATEN PATH OF SURGE PROTECTION

At the beginning of November, Phoenix Contact customers and the media joined the company in Johannesburg, Cape Town and KwaZulu-Natal for a Surge Protection Seminar presented by Holger Heckler from Germany. After an introduction by Dereck Styane, Phoenix Contact National Sales and Marketing Manager, the guests were introduced to the new General Manager of the company, Carl Kleynhans, who took up his role at the beginning of November.

Heckler discussed surge protection for low voltage power systems, exploring the damaging effects of surge-voltage and surge-current impulses and the importance of the selection for overcurrent active devices in electrical installations.

Enquiries: +27(0)11 801 8200



Holger Heckler during his presentation.



Dereck Styane, Phoenix Contact National Sales and Marketing Manager

AMPCO UNVEILS GAME-CHANGING AMPCO GEN 2 PLASTIC RANGE

AMPCO, a specialist industrial plugs and sockets manufacturer and supplier for over 30 years, proudly unveiled the innovative AMPCO Gen 2 plastic plug and connector range to the commercial, mining and industrial sectors across the African continent during a press conference on 17 October 2019 at sister company, Powermite's head office in Roodepoort, Johannesburg.

"The motivation behind the introduction of this advanced plastic range stems from our mandate to further expand and add extra value to our current locally manufactured metal and plastic range," explained Powermite Director, Donovan Marks. "We are extremely proud to offer these state-of-the-art innovations which are poised to set the benchmark in robustness, efficiency and performance. This new-kid-on-the-block exudes premium quality and is competitively priced to benefit customers by cost-effectively maximising their productivity potential."

The compact and robust AMPCO Gen 2 plastic range is forged from Polyamide 6 and PC/ABS. According to Marks, these virgin grade plastic materials put the Gen 2 in a league of its own and provide a host of enhanced benefits: Impact resistance combined with high robustness; high thermal stability (self-extinguishing); great insulating qualities; high disruptive strength; UV resistance according to ISO 4892-2, as well as high abrasion and weather resistance. The plug and socket ranges are internationally standardised by the International Electrotechnical Commission, the world organisation for international standardisation of electrical equipment: IEC 60309-1 and IEC 60309-2, equivalent to the European Norms EN 60309 part 1 and EN 60309 part 2.

With a focus on extending product lifespan, the material also delivers excellent resistance to an array of chemicals and is free from cadmium and halogen. The IP44 & IP67 rated Gen 2 range is suited to arduous applications where portable electrical equipment is used such as electric motor driven and heating machinery, welding, emergency generator supplies, IT installations, quarrying, mining, water purification as well as portable site and stage lighting.

The comprehensive AMPCO Gen 2 plastic range is offered in screwless quick connect and standard screw terminal connecting and includes industrial plugs and sockets 16 A – 125 A, connectors, plastic cable extension reels (XREEL®), heavy-duty engineering plastic site distribution boxes with socket outlets, heavy-duty rubber distribution combination boxes, couplers, wall and flanged sockets 16 A – 125 A, switched interlocked sockets as well as the PRCD-S+ inline portable protection device.

Breaking the cable reel barrier, AMPCO's high impact resistance XREEL® is packed with superior-quality components and features an ergonomic handle, a thermal circuit breaker, a brake mechanism with central spindle, drum openings for water drainage, a stable crank and two parking positions for the plug.

The AMPCO Gen 2 heavy-duty engineering plastic and rubber site distribution boxes with socket outlets can be customised and are at home in gruelling working conditions such as petrochemical plants, dock yards and heavy engineering conditions.

The advanced PRCD-S+ (earth leakage) 30 mA @ 230 V is a portable inline mobile personal protection device to prevent electrical injury especially in construction sites. With operators regularly connecting electrical equipment, the risk of accidents are high. Thanks to its ability to recognise measurement errors, under- and over-voltage,

conductor interruptions and wiring errors from the source system, the PRCD-S+ will not switch on, safeguarding operators against incorrect electrical installations. This easy-to-use, handheld protection device features an LED signal unit which senses error situations, displays a permanent status indication, and disconnects the supply.

Complementing the Gen 2 plastic range is AMPCO's market leading metal and existing plastic range. Complying with the highest European quality standards, the range consists of plugs, socket outlets and isolators, with and without earth leakage protection. The metal single phase socket outlets are perfectly suited to ports and harbours as well as for applications in high humidity areas.

Wrapping up, Marks said they were extremely excited about the new Gen 2 plastic range. "We are confident that these advanced products will play a key role in customers achieving their productivity and profitability goals."

AMPCO, part of the prominent Hudaco group of companies, became a sister company of Powermite in the early 1970s. AMPCO produces products renowned for their quality, reliability and safety; the company's range of CEE products is manufactured to SANS 60309 Part 1 and Part 2 standards. AMPCO supports its extensive product range from branches located in Rustenburg, Witbank, Durban, Richards Bay and Cape Town, supported by a distributor network to deliver exceptional product and service solutions to the customer's doorstep.

Enquiries: www.powermite.co.za



FIBREGLASS REINFORCED POLYESTER CABINETS FOR ELECTRICAL COMPONENTS

Legrand's range of fibreglass reinforced polyester Marina cabinets have been designed for use in any environment, but these durable units are particularly well suited for severe corrosive environments, including chemical and petrochemical, mining, general engineering and marine industries.

Marina enclosures are designed for maximum safety and the ordered arrangement and optimum protection of electrical components like terminal blocks, switches and sockets, fuse carriers, safety transformers and circuit breakers. Marina fibreglass reinforced polyester cabinets are self-extinguishing at 960 °C and can withstand temperature ratings of between -40 °C and +80 °C. These cabinets have an IP66 protection index rating for protection against the ingress of dust and liquids and have been adapted to withstand corrosive environments, with excellent resistance to UV, saline mist, bases chemicals, oils and greases.

The enclosures have a Class II classification, which meets the requirements to create suitable assemblies for photovoltaic installations.

Marina cabinets are available

in sizes between 300 x 220 x 160 mm and 1 220 x 810 x 300 mm, all fitted with a reversible door opening of 180° and stainless steel hinge pins. The cabinets are supplied with a set of internal mounting accessories for easy and secure attachment of equipment to the back of the cabinet. Accessories include double bar locks and metal keys.

The fibreglass reinforced polyester cabinets enhance Legrand's range of stainless steel and metal cabinets, which are manufactured according to stringent quality specifications and are available from Legrand and its national distributor network.

Enquiries: www.legrand.co.za



Donovan Marks, Director of Powermite, proudly displays composite plastic outlet boxes during the AMPCO product launch.





PROTECTING YOUR HOME AND BUSINESS DURING LOAD SHEDDING

Just last month load shedding again reared its head, placing many homes and small businesses at risk, as many of these do not have contingency plans for sudden stoppages due to power outages.

"It is critical that certain aspects of one's home or business are protected against sudden loss of power or surges. Whether it is for your personal use or business, a UPS can safeguard your computers and data against power outages, making it a valuable asset during load shedding," explains

George Senzere Pre Sales Manager Anglophone ITD Global at Schneider Electric South Africa.

"The electronic devices you rely on every day for communication, security and entertainment are at risk for damage and failure because of unexpected blackouts, voltage fluctuations or other power disruptions. Proper backup solutions ensure productivity, comfort and the safety of valuable electronics in the event of a power outage."

Eskom recently said in a statement that while generating plant performance has improved, an unexpected shift such as an increase in unplanned breakdowns could result in load shedding at short notice. Small to medium-sized businesses may be most at risk from load shedding because of their limited ability to generate revenue during downtime and maintain security.

A UPS not only protects and saves the replacement or repair costs for electronic equipment but they are also scalable according to your needs and allow electrical and electronic equipment to continue working through a utility power outage.

"A UPS offers guaranteed power protection for connected electronics. When power is interrupted, or fluctuates outside safe levels, a UPS will instantly provide clean battery backup power and surge protection for plugged-in, sensitive equipment, giving you the necessary time to safely power down non-essential devices and keep critical business operations up and running."

When it comes to home use, their worth extends far beyond keeping your desktop computer online for at least a few minutes in a power outage. The same UPS that works for your desktops will also work for your networking gear.

"Keeping Wi-Fi available rather than having to fall back



to cellular data during load shedding means you and your family have a better chance of staying online cost effectively. A UPS will also provide battery backup power and protection for electronic devices, including televisions, security systems, gaming consoles and even allows for emergency recharging of mobile devices like cellphones and tablets," he says.

In choosing a UPS solution, users should consider that a UPS should be connected to an input power supply point with a capacity of 20-25% higher than the size of the UPS. In addition, runtime is important, giving an indication as to how long a UPS will be able to power its attached equipment in the event of a power disruption.

"The more equipment you have plugged-in to your UPS, the less runtime you will have, so it is important to make sure your UPS is only providing backup power to your most critical equipment. How many devices do you want to safeguard? How does your family use these devices? Perhaps pairing devices for both your home networking equipment and electronic devices is best for your home, or maybe just using a couple of small UPSs for your home office will suffice," says Senzere. "Finally, test the equipment you have by unplugging your UPS periodically to make sure all the attached equipment stays powered."

Enquiries: www.se.com/za

UNIVERSAL ENCLOSURE SYSTEM FOR ELECTRICAL EXPLOSION PROTECTION

For many years, users have been waiting for a new, universal enclosure system in the field of electrical explosion protection. Having invested in this area, Pepperl+Fuchs has developed the GRP enclosure series with its wide variety of relevant features. The design concept is the result of extensive experience in explosion protection and brings together a high degree of flexibility, for wide range of applications with little planning required.

The sophisticated mounting grid demonstrates the tremendous flexibility of the system and its high level of practical relevance. With this design, terminals and control elements can be planned and implemented according to customer-specific requirements and any DIN rails can be easily mounted using self-tapping screws, without the need for time-consuming engineering. An innovative spacer system enables the use of different components at different heights within an enclosure. In addition, this system increases flexibility during the planning process and allows significantly more functions to be combined in a single box.

Flexible planning, efficient handling

The boxes themselves are offered in a range of enclosure sizes and depths, which, when combined with the new spacers, guarantees virtually unlimited flexibility in the planning process and the optimum use of space.

Perhaps an unusually high number of cable glands has been specified? No problem, this is simple to implement with minimum effort. Is an extra row of terminals required in addition to the operating elements?

Just like that, the required result can be achieved quickly and efficiently without mounting plates. And likewise, when planning straightforward terminal boxes the new flexibility offers far more possibilities for customised tailoring. If the customer wants the DIN rail to be mounted slightly higher because cables need to run below it, this can be achieved quickly and efficiently with the new enclosure series.

However, what truly makes the GRP enclosure is its many useful and innovative features. The sealing concept for IP66 impresses not just with a captive formed-in-place silicone foam seal, but the concept also features a new protective upstand that prevents mechanical damage to the sealing edge and is completely unique

on the market. Using this sealing concept, it is even possible to stack the boxes with the lid open with the sealing edge well protected during installation or when adding extensions. A further innovation with significant benefits for process automation, the new GR box can be used at a temperature of -60°C. The customer therefore has a low-cost alternative to stainless steel, in many cases even under difficult environmental conditions.

The new solution also offers significantly reduced effort required for installation. Due to the intelligent design, it now takes just one person to fit even larger and heavier boxes. First, two screws are drilled into the wall and used to hold the enclosure in place. The remaining screws are then inserted, and everything is tightened at the end. This process saves time, therefore considerably reducing costs during installation and maintenance. Another feature the service team may find practical are the especially sturdy hinges that allow easy opening of the lid. The hinges are fastened with screws that do not pierce through the enclosure. This approach is taken for nameplates too. And one more thought put in for practitioners: leverage points for screwdrivers enable easy opening of the lid, thus saving time and ensuring easy handling during maintenance.

Quick availability

For plant engineers and machine builders, what counts in an enclosure solution is not only that it is tailored to their needs, but how quickly the product is available to them. For this reason, Pepperl+Fuchs supplies enclosures that are precisely tailored to user requirements almost as quickly as if the products were available off the shelf.

Terminal boxes and control stations are the first products available with the new GR-enclosure series. Later, the enclosures will become available for remote I/O and fieldbus applications. In addition, an engineering team, specialists in electrical installation and hazardous area protection, stand by to plan tailor-made solutions. During planning, engineering and production, the priority is always the requirements of the enclosure and the shortest possible delivery time.

Enquiries: +27 (0)10 430 0250

CUT THE COMPLEXITY OF PANEL DESIGN



A low-voltage electrical distribution system designed to reduce the complexities often associated with panel design is available from leading local supplier ElectroMechanica (EM). Quadro+ from Hager combines modularity with familiar low-voltage (LV) components to simplify the design of a professional distribution solution.

The Quadro+ modules include assemblies, equipment and accessories required to build a complete enclosure, with IP30 or IP55 protection levels up to 4000 A. According to EM product manager, Christo van Rensburg: "This is a tried and tested international solution, the Quadro+ system is designed around a rigid frame that offers adaptability, ease of assembly, and quick build times, along with quality components."

A feature of EM's value offering is that it can provide customers with complete solutions: when a customer partners with EM, it is able to design and build a complete LV electrical distribution system suited to its requirements.

The Quadro+ system offers support of essential third-party products like Socomec change over-switches, Lovato motor control and metering, Delta variable speed drives and automation products, with little or no additional effort. "This significantly simplifies the complexity associated with completing projects on-time, and gives customers a single point of contact for all of their needs," highlights van Rensburg.

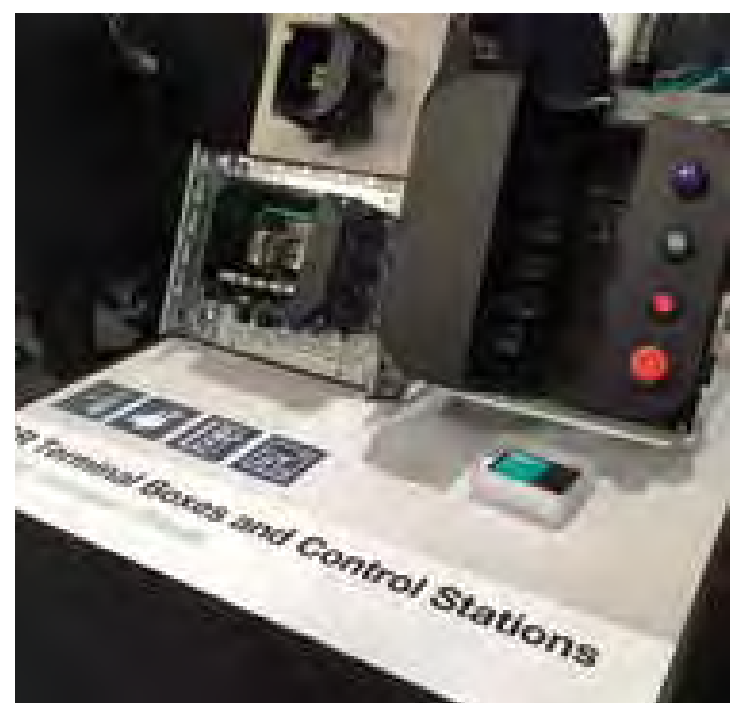
EM offers a comprehensive range of enclosures, from a two-way surface enclosure to a 168-way flush or surface distribution boards. IP65-rated enclosures are also available. While this range is suitable for residential and small commercial buildings, the Quadro+ system is tailored specifically for the larger commercial and even industrial markets.

"When you select Quadro+, you opt for a fully-tested LV electrical distribution solution that has continually proven its worth in different industries. It is manufactured in Italy to IEC and EN-62439-1&2 standards. This means it meets the latest international standards of safety, performance and reliability," stresses van Rensburg.

All enclosures are designed with an extremely rigid structure (IK10 and IP55) for extra durability. Cabinets are shipped flat-packed to save on transportation and storage costs. Only eight screws are required to assemble the frame, and all the screws are pre-mounted for quick turnaround time.

"Thanks to the supporting HagerCad software, planning and designing your system is intuitive, simple and fast," concludes van Rensburg. "You'll also benefit from local technical support and expertise. Whether designing, building, or installing a distribution system, the Quadro+ solution impresses with its convenience and overall quality. EM and Hager see this as a further opportunity to build on their reputation of being a trusted, reliable, and on-time partner for more than 30 years."

Enquiries: +27 (0)11 249 5000





THE 2020 OUTLOOK FOR ELECTRICAL CONTRACTORS

As we are nearing 2020, it's time to look at the electrical industry and identify the new and emerging trends which will come into play. Keeping on top of trends not only helps keep your company from falling behind, but it helps you prepare for the future. There are some trends that continue year after year, and some up-and-coming advancements being made constantly in the industry. The electrical contractor will need new skills to keep up to date with new technologies and systems – failure to develop these will lead to replacement by other trades.

Internet of Things technology presents big opportunities for electrical contractors

Internet of Things (IoT) technology presents businesses of all sizes with significant opportunities to cut costs while gaining valuable business intelligence. But it also relies on infrastructure that requires reliable power – thereby presenting an opportunity for electrical contractors.

By most any measure, the IoT is big and getting bigger. Forbes published a collection of statistics that make the point crystal clear, including:

- By 2020, the installed base of the IoT devices is forecast to grow to almost 31 billion worldwide. By 2025 the installed base of IoT devices will be over 75.4 billion devices.
- \$6 trillion will be spent on IoT solutions between 2015 and 2020 according to PricewaterhouseCoopers.
- The global IoT market is projected to grow from \$2.99 trillion in 2014 to \$8.9 trillion in 2020, attaining a 19.92% compound annual growth rate (CAGR). All that infrastructure and money is aimed at delivering benefits such as improving the speed and accuracy of supply chains, improving quality management, enabling predictive maintenance programs and more. IoT applications require reliable infrastructure. First, it relies on some sort of device – a sensor or a machine running IoT software, for example – that collects and transmits data. The device then sends that data to some sort of collection point. For a small or medium business, that is likely

a small server or appliance located on premises, which then sends the data to a cloud-based service provider or other form of centralised collection point. That's where applications exist that make sense of the data and deliver actionable intelligence back to the business.

The whole setup only works if all the components that play a role are functioning as they should. Having stable and clean electrical power, of course, is fundamental to their reliable function. This is where electrical contractors come in. When doing a job for most any company today, have a conversation about the kind of equipment that will be on site. Find out if the company is using some form of IoT equipment (even if they don't use the term IoT). If so, explain the importance of reliable power to the proper functioning of that equipment and how an uninterruptible power supply (UPS) offers power protection in the event of a utility power outage. That includes clean and stable power, as the UPS acts as a filter thanks to its double conversion technology.

Improved safety equipment

Another construction industry trend that will continue into 2020 is the standard and use of better safety equipment products. Because of the high possibility of accidents and deaths related to construction, it's clear that there will be a push for better safety equipment.

There are a pair of work boots that can connect to Wi-Fi, send GPS coordinates, and can even tell if users have fallen or are tired. While these smart boots may be hard to get now, they could eventually be a commonplace item on the job site. There is also more plausible technology being implemented, such as the use of moisture-wicking fabric and cooling vests. These are just a few of many new equipment advancements that will help keep more of the workers safe on a site and bring about a new era in construction safety.

An upswing in building refurbishment

It is predicted that there will be an increase in

the refurbishment of residential and non-residential property. This will be a major contributor to growth in the construction market and provide more immediate opportunities for the electrical contractor. The electrical contracting industry has the opportunity to build a reputation for expertise and provision of impartial advice, becoming more influential. Electrical contractors can work as advisors in a problem-solving role, assessing buildings to determine work required, then fitting new systems and components. There is also an opportunity to instruct building occupants on how to use their systems.

The high cost of raw materials, in particular copper, may see changes to the traditional products used, including the way that buildings are cabled. The drive to reduce construction costs will be apparent in changes to the supply chain, with specialists like electrical contractors expected to change working practices to allow greater efficiency. This will involve working more closely with the designer and the main contractor, and often dealing with more knowledgeable customers.

Social issues and influences

As energy becomes a scarce resource there will be a need to re-educate the population in its use, requiring education programmes at school, home and work. This could be driven by energy providers, system manufacturers and electrical contractors.

Currently only 1.4% of the construction workforce are women in non-administration roles. It can be anticipated that there will be more women working in electrical contracting by 2021 as a result of pressure for a balanced workforce and as a result of retraining to meet skills shortages.

How people interact with each other and the relationship between customers and suppliers will also evolve, driven by the internet which represents a key opportunity for the industry. By 2021, as a result of projects such as the implementation of 5G, we can expect broadband internet to

be 100 times faster with many new forms of information delivery. This will enable the growth of social networks such as Facebook, LinkedIn and Twitter, allowing consumers to more easily share information about products and service providers. Already holiday feedback sites are replacing traditional systems for rating hotels, this will expand to cover most services. As a consequence, failures in quality of service will become public very quickly. This method of recommendation will also replace traditional forms of advertising trade services such as the Yellow Pages.

Extended Reality

Another trend to look out for in 2020 is Extended Reality (XR), a catch-all term that covers several new and emerging technologies being used to create more immersive digital experiences. More specifically, it refers to virtual, augmented, and mixed reality. Virtual reality (VR) provides a fully digitally immersive experience where you enter a computer-generated world using headsets that blend out the real world. Augmented reality (AR) overlays digital objects onto the real world via smartphone screens or displays (think Snapchat filters). Mixed reality (MR) is an extension of AR, which means users can interact with digital objects placed in the real world (think playing a holographic piano that you have placed into your room via an AR headset). We have already seen AR used by lighting companies – for instance BEKA Schreder's AR App, but in 2020, expect businesses get to grips with the wealth of exciting possibilities offered by both current forms of XR. Virtual and augmented reality will become increasingly prevalent for training and simulation, as well as offering new ways to interact with customers.

It is clear that the electrical industry is changing, and the above trends could be just the tip of the iceberg. Opportunities abound. The key for electrical contractors is to start a conversation, and get customers thinking about their electrical installations in a new, modern light.

VALUE OF EMBEDDED GENERATION IN MUNICIPAL BUDGETS

SCHNEIDER ELECTRIC recently won best paper at the Association of Municipal Electricity Utilities' (AMEU) conference. Poonam Lutchman, Digital Solution Architect, Schneider Electric South Africa presented the award-winning paper on 'Incorporating embedded generation into municipal networks'. It looks at possible ways to reduce the financial impact caused by privately owned microgrids and generate sustainable revenue in the process.

"Embedded generation describes the small-scale production of power connected within the electricity distribution network, located close to the place of consumption. It entails the production of electricity from generation facilities connected to the national grid, with or without wheeling arrangements," explains Lutchman.

"Currently there is a move to incorporate this transformation into South Africa's legislation. The Integrated Resource Plan (IRP), which is the energy blueprint for South Africa, makes provision for

embedded generation, currently at 200 MW. On 2 May 2019, the Department of Energy sent a letter to the National Energy Regulator of South Africa (NERSA) granting a deviation from the existing IRP for licensing operation of generation facilities ranging from 1 MW to 10 MW, with a limit of 500 MW annually applicable for own use generation.

"Studies show that 97% of photovoltaic (PV) solar power is generated between 9am-6pm. This is also the time when municipalities could recoup their losses and represents up to 60% of profit loss. These changes to peak pricing are more significant for municipalities that are more exposed to the residential sector than Eskom. Although residential use of electricity in South Africa represents 18% of all electricity demand, at peak times residential demand represents over 35% of total demand. At present, large municipalities are already supplying electricity to residents during winter peak times at a loss. The peak period, five hours of the day

in winter, accounts for half of the total cost of all electricity supplied on the day in question. A stylised representation for a municipality might be as stated on figure 1:

"The problem becomes more acute when 'losses' during peak times are not fully recovered from the sale of electricity during off-peak and standard times. Higher flat rate residential tariffs mean that South Africans have to save electricity where they can. However, they save during standard and off-peak times, which is where the surpluses are generated.

"Moreover, residents and businesses paying the highest block tariffs are looking to move to solar water geysers and embedded generation (largely installing PV panels). Yet, during the early mornings and evenings (peaks), these customers are still drawing electricity from the grid, which makes them increasingly less profitable. Municipalities are not able to fully recover their position due to the flat tariff imposed on these customers.

"Currently residential and commercial consumers with PV or other alternate forms of energy do not pay fully for their share of the systems fixed costs. This shifts the burden to households without PV systems.

Global realisation of need for change

"Globally and in South Africa, utilities and municipalities are recognising that their conventional business model needs to change. In its own strategy document, EnBW (German utility) declared that 'conventional

business models of larger power supply companies no longer work. In South Africa, municipalities around the country are also challenging the 'single buyer' model, which restricts the purchase and sale of electricity to Eskom. They intend to purchase electricity directly from independent power producers.

Grids of the future

"Microgrids and distributed energy resources (DER) represent the grid of the future and municipalities need to become autonomous and secure sustainable revenue by getting ready for DER integration.

"The integration of DERs into the grid has made the grid more complex and dynamic. Hence, there needs to be changes in the way power systems are planned, operated and analysed. This requires a combination of infrastructure and technology initiatives and the need for grid analytics.

"Manufacturing advancements in IoT and OT to make field devices more intelligent and allow better communication can assist municipalities in this regard. Schneider Electric has international capabilities coupled with local expertise in this field. It can assist with the complexity of systems and provide technologies. The Smart Grid concept of decentralised automation and control will allow municipalities to become more responsive, as the network is broken down to sections that are more manageable.

"Municipalities can stay relevant and ensure a sustainable source of income by altering their business model to include embedded generation solutions and hence provide value to their end customers," concludes Lutchman.

Enquiries: www.se.com/za

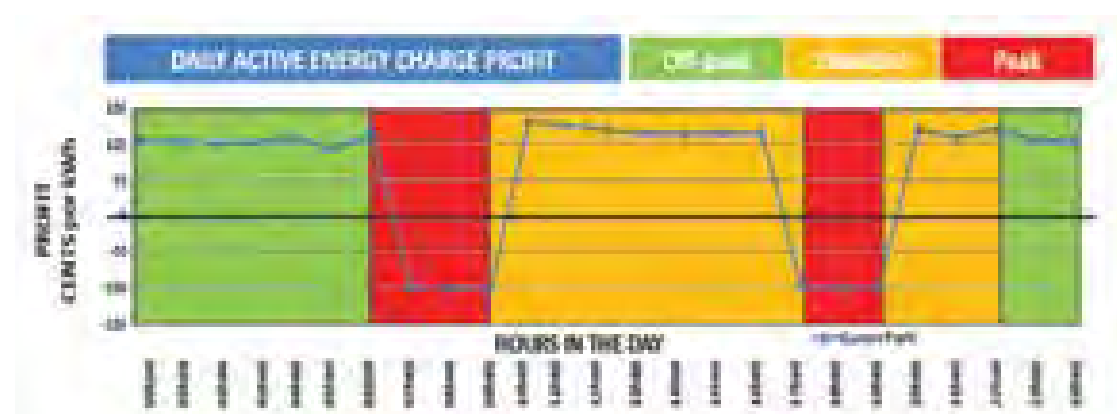


FIGURE 1: Source: D De Vos, A solution to SA's Power Crisis <https://techcentral.co.za/a-solution-to-sas-power-crisis/58482/>

MECHATRONIC DEVICES FOR VARIABLE SPEED CONTROL



BMG's range of Danfoss electronic, mechanical and intelligent 'mechatronic' devices, includes the VLT® AutomationDrive FC 300 series, designed for variable speed control of all asynchronous and permanent magnet motors on most industrial machines or production lines – even in demanding applications and challenging environments.

The Danfoss VLT AutomationDrive FC 300 series, with intelligent drive functions, is based on a flexible and modular design to optimise energy-savings, versatility, efficiency and maintenance. This robust drive system, with reduced harmonic impact and a spark-free design, is protected against the negative effects of vibration, moisture and dust and has the flexibility to operate pumps, conveyors, palletisers and material treatment equipment, ensuring optimum control and dependable operation for extended periods.

"The VLT AutomationDrive – which has received global awards for innovation and user-friendly features – reduces project costs, ensuring the lowest possible cost of ownership while maintaining high-efficiency processes," says Mick Baugh, Electronics Manager, Electromechanical division, BMG. "As with all Danfoss drives, this system is motor independent to offer the flexibility to be able to select the correct motor for specific applications. Danfoss makes an ongoing investment in advanced technologies, to ensure all systems comply with current and future demands in the drives sector. With the implementation of the VLT AutomationDrive into a plant, the BMG team ensures a seamless transition into Industry 4.0."

"The VLT AutomationDrive FC 300 series boasts both hardware and software enhancements that maximise performance and a new Ethernet platform for improved communication. This range also encompasses new generation E-frames and lower temperature ratings."

This modular and adaptable drive system is suitable for installation in any environment – close to the motor, in electrical panels, switch rooms or outdoors and as stand-alone units in the production area.

This system has an advanced thermal design and back-channel cooling and is one of the most compact and cost-efficient air-cooled drives in the range of 90 kW to 800 kW at 500 V. This robust and intelligent system has been designed to simplify every step in the installation process, including wiring, programming and operation.



The VLT AutomationDrive, which is compatible with leading motor and fieldbus technologies, offers web-based configuration, Electronic Data Interchange (EDI) and access to drawing and engineering diagrams. The system also provides tools for harmonic and motor-drive system efficiency calculations. There is a flexible interface to the drive data from multiple access points, including directly at the drive, via mobile applications, through an integrated web server and via cloud connectivity.

The standard functionality of the VLT AutomationDrive can be expanded by replacing mechanical controls with energy-saving electronic motion control options. With the Integrated Motion Controller (IMC) functionality, the VLT AutomationDrive 302 replaces more complex positioning and synchronisation controllers to save time and costs.

Application-dedicated functions for optimum performance include droop functionality for load sharing, an integrated brake control for the safe operation of hoists and an integrated process controller for demand-based pumping.

This drive system has an intelligent troubleshooting and remote access facility and also features preventative and predictive maintenance functions that ensure trouble-free operation for reduced maintenance costs and avoiding unplanned downtime.

The VLT AutomationDrive can withstand operation in all industrial environments and low voltage grids, including production facilities operating from 690 V mains networks. AC drives are available in various enclosure sizes and protection ratings, from IP20 to IP66. Integrated DC chokes and RFI filters in all units protect installations by minimising harmonic distortion and electromagnetic interference.

Typical applications for this system include mining and minerals, food and beverage, packaging, water and wastewater, marine and offshore, chemicals, cranes and hoists, elevators and escalators, materials, oil and gas and textiles.

BMG has recently been appointed as a Danfoss DrivePro® Service Partner – the only company in Southern Africa to achieve this level of recognition and one of the first 30 companies appointed as part of this programme globally.

Enquiries: +27 (0)11 620 1538

SIEMENS PLANS THE ACQUISITION OF EDGE TECHNOLOGY FROM PIXEOM

SIEMENS is planning the acquisition of Edge technology from the US company Pixeom. With this action, Siemens is strengthening its Industrial Edge portfolio by adding software components for Edge runtime and for device management. Siemens Industrial Edge provides an ecosystem, which enables the flexible provision and use of apps. This means for example that appropriate apps can analyse data locally at the machine and send relevant data to the higher-level Industrial Edge Management System for global analytics. With this acquisition, Siemens is driving forward the expansion of its Digital Enterprise portfolio and the integration of cutting-edge technologies for the digital transformation of industry.

With the resulting Industrial Edge ecosystem, industrial companies can use production data even more efficiently and react more flexibly to changes in conditions. Ralf-Michael Franke, CEO of Business Unit Factory Automation, explains: "Cutting edge technologies such as Edge Computing open up new scope for automation. With Siemens Industrial Edge, we are creating an open edge ecosystem which offers benefits for companies of any size."

Enquiries: www.siemens.com

PROTECT CRITICAL INFRASTRUCTURE AND MANUFACTURING PLANTS



As manufacturers around the world analyse and embrace the importance of being more connected to the Industrial Internet of Things (IIoT), cybersecurity experts caution that the benefits of being interconnected come with a warning, and companies need to protect their industrial plants from being hacked.

This is according to Stefan van de Giessen, general manager: cybersecurity at value-added distributor Networks Unlimited Africa, who says, "The IIoT allows tools and machinery of all types to be connected to the internet, bringing major benefits but also risks to the business that, by and large, simply did not exist a decade or so ago. In South Africa, manufacturing is the fourth-largest contributor to the economy, according to Statistics South Africa. This makes the importance of protecting manufacturing plants – as well as critical infrastructure of course – even clearer."

"When hackers attempt to penetrate a manufacturing/supply chain network, they know that the organisation is working according to a set schedule, and that the number of working hours available in any 24 hour period is valuable, with a slim margin for downtime. This is why it is potentially so lucrative to try to hack into the system in order to, for example, cause damage, loss of data or downtime until a sizeable ransom is paid."

A recent study by the IBM Institute for Business Value (IBM IBV) showed that industrial companies are not doing enough to protect their plants from being hacked. The Institute clarified that 'Deploying technologies at a faster pace than securing them can open up an internet of threats' and also that 'For industrial manufacturing, chemical, oil and gas, and utilities, security breaches can lead to large-spread contamination, environmental disasters, and even personal harm.'

"Another IBM IBV research document found that almost 90 percent of the automotive companies surveyed were using these technologies without fully evaluating the risks or preparing effective responses, thereby leaving themselves vulnerable to cyberattacks," continues Van de Giessen. "I believe we could take this as a proxy for other manufacturing industries, and even if the numbers don't play out exactly the same, this points to the new reality of the threat of cyberhacking in the manufacturing industry, and the critical need for organisations to protect themselves."

To this end, Networks Unlimited Africa has recently partnered with Indegy, a leader in industrial cybersecurity that protects industrial control system networks from cyberthreats, human error and malicious insiders. Networks Unlimited Africa now brings Indegy solutions to South Africa and throughout the continent. Van de Giessen clarifies, "Indegy undertakes to protect industrial control systems from external cyberthreats, malicious insiders and human error. External threats bring the most risk potential – a well-planned cyberattack will usually cause significant damage, which can include physical damages, financial costs and reputational threats for the business."

In the manufacturing sector, Indegy was recently involved in securing the Supervisory Control and Data Acquisition (SCADA) network of the largest cement producer in Israel, which has two large-scale production sites in two different places. Together, these sites produce about 60 percent of the cement used by Israel's construction industry. With the introduction of connected technologies, Nesher realised that its SCADA network could potentially be exposed to cyberthreats that could jeopardise the safety and productivity of its factories. Therefore, determined to reduce risk and also minimise production downtime, the management team chose Indegy after deciding to invest in a dedicated industrial cybersecurity solution.

Nesher required full visibility of its complex SCADA/ICS network, together with real-time 24/7 alerts on any changes to its controllers. This level of visibility is crucial for enabling early detection and mitigation of security risks before they impacted on productivity or endangered employee safety. The system implemented by Indegy offers maximum visibility using proprietary technology that actively queries devices in Nesher's industrial environment, ensuring that its SCADA engineers are aware of all changes to all assets in the environment. Additionally, the Indegy user interface design makes it easy for Nesher's engineers to control traffic and operations in the SCADA network, while the accuracy of the alerts means that the security analysts can focus their efforts on investing real threats, with a minimum of false positives.

"With the boundaries between IT and OT blurring, industrial infrastructure operations are now part of the connected, online world, and are no longer stand-alone entities. However, the rapid pace of change means that many industrial operations are still running on old control systems and, as such, are more vulnerable to today's cybercriminals. A solution like Indegy allows security operators and engineers alike the comfort of knowing that their plant is protected from cybersecurity threats according to the highest standards available," concludes Van de Giessen.

Enquiries: +27 (0)11 202 8400



LED LIGHTING FOR WESTERN CAPE SCHOOL



The Generation Schools Imhoff in Kommetjie, Western Cape, has installed an energy-saving LED lighting solution for its swimming pool and sports field. Generation Schools Imhoff opened its doors to students in January 2019. The school needed a lighting solution for its newly built swimming pool and sports field and BEKA Schröder was chosen for its energy-saving LED lighting solution, which offered very good light levels.

Swimming pool

The swimming pool is illuminated with BEKA Schröder's OMNistar-midi 216 W. Its IP 66 ingress protection makes it perfectly suited for this damp environment. The OMNistar-midi was designed and manufactured in South Africa, and boasts a long lifetime with low maintenance requirements, and no lamp replacement for more than 10 years.

Various optical solutions are available to achieve the highest energy savings and the most economical lighting solution.

Sports field

The multi-purpose sports field for rugby, cricket, soccer and hockey is illuminated with the OMNiblast-2-E 990 W. The OMNiblast-E is ideal for sports venues and other large area applications that require a lighting solution with the highest efficiency and flexibility to adapt to the different lighting needs. Available in three sizes, this LED solution offers an alternative with proven benefits for traditional fixtures fitted with 600 W to 2000 W HID lamps.

A modular concept of optical units means that 1, 2 or 3 modules can be mounted on a similar bracket arrangement to offer the utmost versatility, providing light distribution and lumen packages perfectly adapted to the specifications of the area to be lit. The OMNiblast-E incorporates a patented cooling technology that maximises its lifespan and lumen output.

BEKA Schröder locally develops and manufactures LED lighting products, designed and suitable for African conditions. The company is proud to be associated with Imtiaaz Mohamed Ime Consultants in providing a successful LED lighting solution for this project.

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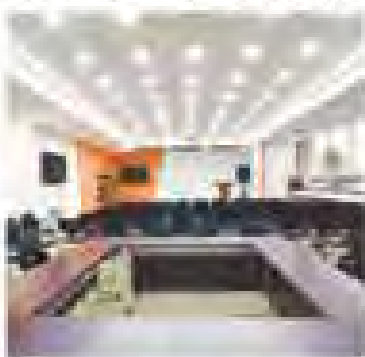
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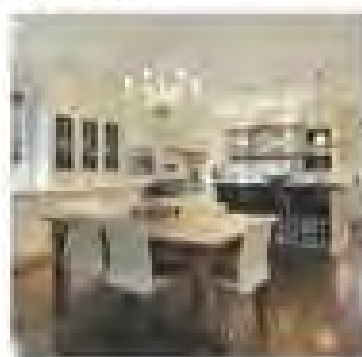
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LAPTOP MAKER SET TO EMBED LI-FI CHIPS

One of the main things holding back Li-Fi from general adoption is the absence of any end user devices that embed the technology, which currently requires attaching a dongle to a laptop, tablet, or other personal electronics. Now, Scottish pioneer pureLiFi has taken a step toward resolving that issue.

The Edinburgh company said that Taiwan's ruggedised laptop and tablet maker Getac is considering embedding pureLiFi chips into products that Getac makes for harsh physical

Li-Fi





SMART LED LIGHTING IS PERFECT FOR EMERGENCIES

Emergency lighting is integral to evacuation plans for any building, whether it's an office, factory or warehouse, retail or leisure facility, multi-occupancy residence or educational place. With any loss of power, an effective emergency lighting system ensures the safety and peace-of-mind of everyone on the premises. Evacuating people out of a building in darkness can be difficult and dangerous, but emergency lighting systems ensure that the path to safety will be well-lit and easy to navigate. And, while safety of building users, owners and occupiers is the main priority, it will also help emergency services perform their task more effectively.

Smart LED lighting systems have the potential to transform the implementation of emergency lighting in buildings. Manual testing is tedious, time-consuming, costly and may be prone to human error. An emergency lighting monitoring system enables building managers to automate routine and periodic testing of emergency lighting, also the regulatory reporting and recording of test results. Areas where automation of the emergency lighting process should be strongly considered are in multiple occupancy dwellings, such as social housing, care homes, healthcare, education, hotels and leisure. In the wake of recent events like the Grenfell Tower disaster, the spotlight has fallen on preventing emergency lighting failures that contributed to these tragedies.

Smart LED lights, connected to the building services, create new opportunities. For example, lighting can be connected to the buildings alarm system. In the event of a fire alarm, all lighting can be triggered to 100% on to assist the evacuation. Battery back-up mode can be activated only when the mains power to an area fails. Implementation of these solutions is simplified by the recent introduction of simple, scalable, lighting control systems such as Light Boss.

Light Boss™ creates a wireless lighting network, controlled by Android App or web interface, with simple software to set and adjust the building's lighting. The control system connects wirelessly to individual light fixtures creating a network of tens or even thousands LED lights. Right out of the box, Light Boss™ provides self-test emergency light monitoring, allowing operators to check for faults remotely without testing individual light fittings; also eradicating the need for manual reporting. In addition, it provides live reporting on energy consumption of all connected lighting fixtures, allowing energy management of a single site or a group of sites, making it the ideal tool for complete energy performance of multi-site installations.

Lights can also be programmed specifically to respond to an emergency events – for example ensuring that people inside the premises have all the illumination they need. Lights can follow the escape route through the building, assisting the response team. They can also light the response team's path towards the people in the danger zone.

It is everyone's hope that emergency lighting systems are never used, but the use of LED fixtures keeps the cost of this 'insurance' to the minimum, and compliance to the full. Implementation with easy-to-use, cost-effective solutions for smart monitoring and control increases confidence that the systems will work when they are needed most. It's all about safety and peace-of-mind.

Enquiries: www.lightboss.co.uk



Nordland Lighting wishes to extend our gratitude towards Crown Publications, the readers and all our customers for their support over the past year.
Happy holiday's and a prosperous 2020 to all!

Happy Holidays!

NORDLAND LIGHTING

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settings including military and workplaces where gadgets can take a beating. Li-Fi uses modulated light waves from LED luminaires or other LED light sources – rather than the radio waves of Wi-Fi and cellular – to wirelessly transmit data and access the Internet. It will potentially open up a vast amount of spectrum that would help alleviate a Wi-Fi bandwidth crunch, and minimise the delays and interference associated with Wi-Fi.

It is also more secure than Wi-Fi, given that it requires a direct line of sight to access. Getac is examining possibilities for the technology via its European, Middle East, and Africa (EMEA) group. "Getac will continue to evaluate the technology with customers to understand the best use cases for their core industries, with a view of designing Li-Fi into future devices as part of the Getac portfolio," the two companies said in a joint announcement.

The companies did not indicate which scenarios they think would be most likely to deploy ruggedised Li-Fi. Getac's products are used by military and police groups, by manufacturers such as automobile makers, by outdoor work crews, and others.

"We look forward to leveraging on this highly innovative technology to provide customers with secure and reliable products that will further enhance productivity and safety in the workplace," said Amanda Ward, Getac director of EMEA products and solutions.



OSRAM'S LATEST INFRARED LEDs TAKE THE DIZZY OUT OF VR AND AR



INDUSTRY LEADERS SHAPE THE FUTURE OF LIGHTING AT THE LRC SUMMIT

In October a group of leaders from industry, academia and government gathered at the Lighting Research Center (LRC) in New York for the LRC Summit. The goal of the summit was to inspire discussion and shape the future of lighting, where the industry plays a strategic, recognised role in benefiting society and the environment – from improving human health to enhancing food production to managing clean energy in the new electric grid.

On the first night of the Summit, Dr. Mark Rea offered opening remarks, setting the stage for the entire three-day event. The lighting industry right now is like the movie 'Mad Max,' cautioned Rea, and the only way forward is for the insular lighting community to form new collaborations with those outside our limited circle, and to stop "talking to ourselves"; otherwise lighting will become "just a commodity."

Three pillars

The second day of the Summit featured keynote speakers for each of three pillars: Lighting for Healthcare & Humanity, Agricultural Lighting, and Lighting & the Grid. Dr. Robert White, director of the Regional Newborn Program at Beacon Children's Hospital and Chair of the Standards Committee for NICU Design, discussed the impact of the physical environment on the wellbeing of patients, families, and caregivers. One important takeaway from his talk was the importance of multidisciplinary leadership in developing standards for NICU Design, which led to significant, tangible improvements to the NICU environment. Dr. Mariana Figueiro, LRC director, presented select light and health research studies conducted by her team at the LRC. Anyone in the lighting industry is by now well aware that light offers many benefits related to circadian health and wellbeing. Yet many spaces such as schools, offices, and nursing homes are dimly lit, which can unfortunately lead to negative impacts on health ranging from insomnia to depression to increased risk of certain types of cancer. Figueiro's research has shown that a specific amount, timing, duration, and distribution of light can significantly improve sleep, mood, and general wellbeing for newborns in the NICU, students in schools, office workers, and older adults, including those living with Alzheimer's disease. She also presented LRC studies showing how light can reduce depression and fatigue in cancer patients and support alertness in night-shift nurses.

"Tailored lighting, when properly designed to deliver the correct amount of light at the right time, can positively impact health and wellbeing," said Figueiro. "We have seen firsthand the many benefits of lighting, but it is important to get the right lighting to see the positive effects." Figueiro asked the audience, "How can we, as an industry, use the research to make people's lives better?"

The next keynote was presented by Dr. Roger Beachy, Professor Emeritus in the Department of Biology at Washington University, who led the National Institute of Food and Agriculture under President Obama. Dr. Beachy discussed global challenges in agriculture and food systems. "Climate change is arguably the most significant existential threat that humankind has faced," said Beachy. "How we adjust the future of agriculture today and in the next one to two decades will determine the wellbeing of humankind into the future."

His talk was followed by updates on LRC agriculture and horticulture research studies by Dr. Ziggy Majumdar, director of development at the LRC. Agricultural lighting was identified by Summit participants as an important area of research that could have significant benefits for humanity, especially regarding reducing pesticide usage by supplementing pesticides with UV light to destroy pathogens and pests. The final keynote was delivered by Janet Joseph, senior vice president for strategy and market development at the New York State Energy Research and Development Authority (NYSERDA). She discussed New York's nation-leading climate agenda and Green New Deal in her keynote titled "New York's Climate and Clean Energy Agenda: Building the Grid of the Future." Ms. Joseph, who leads NYSERDA's work in building decarbonization, then joined a panel discussion with other lighting and energy experts: Chris Wolgamott, senior manager for commercial and residential lighting at the Northwest Energy Efficiency Alliance; Jerry Duffy, general manager at GE Lighting; and Francis Rubinstein, principal, RubyLight Consulting and former staff scientist at the Lawrence Berkeley National Laboratory.

Bringing it all together

Day three of the summit was the capstone experience, a workshop led by industry veteran Govi Rao, co-founder and managing partner of Carbon Group Global and champion of sustainability. Building on the foundation of the first two days, this last session of the conference focused on laying the groundwork for a collaborative, integrated, and comprehensive approach involving all stakeholders from public and private sectors to academia and civil society to reframe lighting in the context of the UN Sustainable Development Goals (SDGs) and the Fourth Industrial Revolution – placing customers at the epicentre of the economy and improving how they are served.

"As responsible leaders seeking to guide this revolution toward a future that reflects our common objectives and values, we are working to develop a comprehensive and globally shared view of how light and lighting technologies are affecting our lives and reshaping our economic, social, cultural, and human environments," said Rao.

Enquiries: www.ledsmagazine.com

OSRAM has introduced two more LED chips for new markets, this time releasing two infrared (IR) LEDs for use in virtual and augmented reality (VR/AR). Osram said the Firefly SFH 4030 and SFH 4060 LEDs both help prevent feelings of discomfort and dizziness that people can suffer when using AR and VR glasses. The chips track eye movement, providing a "targeted point of reference, allowing users to safely immerse in other worlds," Osram said.

They are packaged in a system in which IR light illuminates the eye, a camera sensor measures the reflections, and software determines imaging adjustments after it measures the exact position of the eyes and viewing direction of the user, the company explained. The SFH 4030 operates at 940 nm and avoids the 'red glow' effect. The shorter-wavelength SFH4060 provides higher sensitivity at 850 nm, but red glow is more likely.

Both the 4030 and 4060 include a black cap that Osram said makes the infrared LEDs (which the company calls IREDs) "invisible" when installed. "Eye-tracking offers a very intuitive way of human-machine interaction for AR and VR applications, including displaying important information about the focused object," said Bianka Schnabel, product manager at Osram

Opto Semiconductors, the company's chip division. "With the IREDs' two wavelength options and black package, we are broadening the options for our customers, and at the same time, making system integration easier."

The additions are the latest in a steady stream of specialty chips the company has added as it rebrands itself as a 'high-tech photonics' company, focused more on LED and laser chips than on general illumination including lighting in Internet of Things (IoT) schemes. Only recently, for example, Osram added two IREDs aimed at enabling facial recognition on smartwatches.

The shift could create synergies that would help Austrian sensor company ams acquire Osram, an acquisition that Osram's supervisory and management boards have backed. AMS is bidding for Osram shares via the public stock market. In its latest offer, it is seeking a minimum of 55% of the company. AMS has twice lowered that threshold, which it originally set at 70% when it first went to the market in early September and subsequently trimmed to 62.5% and now 55% as it eases terms in hopes of completing the deal.

Enquiries: www.osram.com

LIGHTING FOR HAZARDOUS AREAS

Hazardous area or explosion proof lighting is one of the most challenging sectors in the lighting industry. Often requiring the ability to perform in extremely harsh environments, safety is paramount. Consequently the sector is relatively slow to adapt to new technologies and use of rigorously tested, and proven, products is necessary.

Hazardous area lighting gives you safe illumination in areas where conventional lighting products cannot be used, either due to safety concerns or a lack of access for maintenance. Common applications include:

- Zone 0 lighting in areas at high risk of explosion.
- Outdoor lighting for docks, oil rigs and other exposed locations.
- Signal lighting for heli pads and bulkheads.
- Inspection lighting for tanks and enclosed areas.
- Emergency lighting for fire exits and escape routes.

Other applications take advantage of hazardous area lighting for its wide range of operating conditions, for example, in locations that experience a high temperature range or frequent sub-zero weather.

Source lumens vs. delivered lumens

When selecting a luminaire for use in a hazardous area, there are lots of different factors to consider. The lumen output (or power) of the luminaire is one of these important considerations. But are all lumen output figures comparable?

Source lumens: The 'source lumens' value is the total amount of light the luminaire emits at source, before it is transmitted through any lens or diffuser. Lumens are lost with every reflection, refraction or absorption through each material the light passes through, resulting in the value of 'delivered lumens' being less than the stated, emitted figure. The output can also be blocked or dispersed due to the luminaire's mechanical build interrupting the light flow, particularly at the extremities of the beam angle.

Delivered lumens: 'Delivered lumens' is the most accurate measure of how the luminaire will perform once installed. It is the actual amount of light delivered on scene, taking into account all barriers such as lenses, housing, and any filtering effects.

Which figure is used by hazardous area lighting manufacturers?

There is a large degree of uncertainty when comparing lumen output figures from different manufacturers. The 'delivered' value is considered the more equitable figure to use, but with no official standard to follow, there is nothing to say that this is the value all manufacturers are using. Identifying which figure is being used can often be very unclear and diffi-



cult to identify. This is especially true if photometric files (which give a true reflection of performance) are not readily available. Imagine the scenario; you are specifying lighting for a project and are choosing between two luminaires from different manufacturers. Unbeknownst to you, each manufacturer has calculated the lumen output value in different ways; luminaire A is using 'source lumens' and luminaire B is using 'delivered lumens'. On paper, the performance of two luminaires may seem similar, but the reality is likely to be very different. As a customer, do you query the 'delivered lumens' figure when purchasing a luminaire?

Cold storage and freezing rooms

The struggle between light and cold is an on-going issue in the cold storage industry. Since fluorescent lighting does not perform well in cold conditions, businesses have had to install a greater number of low-efficiency luminaires in order to comply with lighting needs. Going forward, LED lighting, which thrives in such environments, is the solution. Temperatures in cold stores range from 0 to 15 degrees while freezing rooms can go as low as -40 degrees Celsius. Therefore, lamps, operating gear and luminaires need to meet higher requirements for operating conditions. With conventional luminaires fitted with HID and HPS light sources, energy consumption is high, as is the heat production.

Also, lamp shifts are frequent, start-up times are long and hence sensor control systems are less suitable. LED light sources, on the other hand, consume less energy, need no lamp replacement, produce less heat and ignite immediately. They also lose less light compared to many conventional light sources. Finally, the low ambient temperature increases LED light source and operating gear lifetimes significantly. With LEDs, lighting quality is no longer compromised, it is enhanced. Standard illuminance requirements in cold stores are low, but more light would make labels and storage documents easier to read. Luminaires in damp areas need a high IP rating and should be maintenance-friendly.



HKTDC INTERNATIONAL LIGHTING FAIR 2019 REPORT BACK

SPAZIO LIGHTING was fortunate enough to attend the Hong Kong Trade Development Council's (HK-TDC) Hong Kong International Lighting Fair Autumn 2019. Attending this fair gave the company the opportunity to meet with current and potential suppliers as well as to view the latest trends in lighting technology and design, in order to introduce fresh designs and groundbreaking technologies to the South African market. This year's fair certainly did not disappoint, with an array of interesting new designs and technologies on display.

There were a number of new lighting trends that really stood out. Whether for decorative pendants and table lamps, interior spots or even exterior fittings, black and copper are two colours Spazio cannot get enough of. Plain black fittings or black fittings with accents of copper were very popular, while copper on its own also makes a really bold statement. You are already seeing a lot of this trend in South Africa, but expect to see a lot more in the next few seasons.

Home automation and smart lighting are still gaining popularity and have seen some technical improvements. These revolutionary lighting technologies are made to align with the new smart lifestyle of the modern user. You will soon be able to control your home, including your lighting, using one app that is probably already preloaded on your iOS or Android smart device. From switching your lights on and off, even when you are not at home, to dimming the lights or changing the colour temperature, the possibilities are endless. Be on the lookout for these new technologies to be introduced into Spazio's range in the near future.

Light fittings with classic designs have become very limited. All the light fittings, be they decorative or technical, have very modern and minimalistic

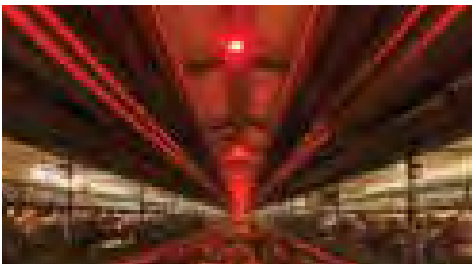
designs. Uncomplicated designs with sleek lines are definitely the current trend and Spazio does not see this changing any time soon. You can also expect to see more glass elements, especially in decorative, but also technical light fittings. Finally, these modern designs are also allowing for the light sources to be more recessed or sunken into the fitting in order to produce light beams that have low glare to create better ambience.

Be on the lookout for these trends which will be introduced into Spazio's wide range of products soon.

Enquiries: www.spazio.co.za



SIGNIFY ACQUIRES TWO AGRICULTURAL LIGHTING COMPANIES



SIGNIFY has expanded its business for agricultural lighting as it recently acquired Once Inc., based in Plymouth, Minnesota, and iLOX, based in Vechta, Germany. Once and iLOX are market leaders in the design and manufacture of animal-centric lighting. These tailor-made lighting systems improve the quality of life for livestock, which leads to healthier and enhanced production for the farmer.

"With this acquisition, we add know-how, technology and expertise in animal lighting that complements ours in horticulture lighting. We are very pleased to partner with the teams of Once and iLOX to combine our innovations to capture growth," stated Bill Bien, Business Leader Agriculture, Signify. "This next step in the development of our Agriculture Business addresses the global need for feeding the world's growing population, further unlocking the potential of light for brighter lives and a better world."


"We are excited to become part of Signify. The potential market is young and growing and we look forward to working together to further improve animal welfare and farmers' production," said Zdenko Grajcar, CEO and Founder of Once.

Once Inc. was founded in 2009 and signed an agreement to acquire Germany-based iLOX in 2018, adding sales and service capabilities outside the US. The transactions are expected to close in the second quarter of 2019. No financial details about the transactions were disclosed.

Enquiries: www.signify.com

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STUDY PUBLISHED ON THE PERCEPTION OF WHITE LED LIGHT

THE OPTICAL SOCIETY (OSA) has published research in its Optics Express journal which suggests human perception of phosphor-converted, white-light sources varies with the age of the person viewing the light. Presumably, the short-wavelength energy in the blue or violet spectral region is the culprit, although it appears the field of view is also an issue – a phenomenon we have reported on previously. The intent of the research is establishing a knowledge base that solid-state lighting (SSL) product developers can leverage to deliver consistent chromaticity perception to everyone who views an LED-based product, ranging from general illumination lamps and luminaires to backlit displays.

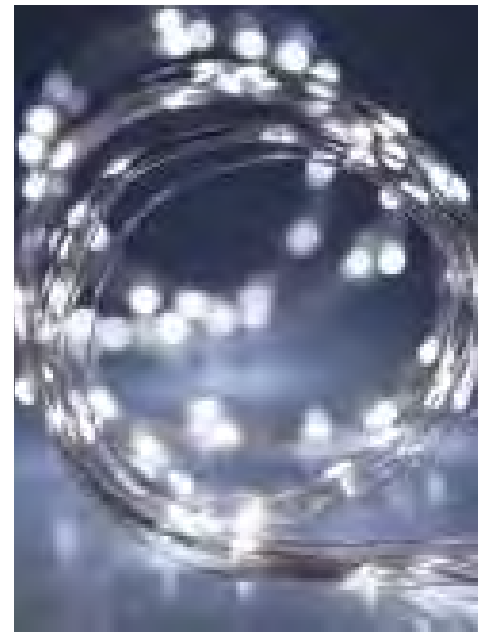
The research was performed by Soraa scientists and engineers, including research team leader Aurelien David. “Our study revealed that the amount of short-wavelength light a source emits together with the viewer’s age may lead to very different perceptions of a white light,” said David. “LED

light sources exacerbate this effect, because their emission often features large peaks of blue or violet radiation.” The research relied primarily on Soraa’s blue-free (BF) LEDs that integrate a violet pump and a phosphor formulation that produces virtually no energy in the blue spectral region. We published an article on that technology a couple of years back and its intended application in circadian or human-centric lighting. Upon seeing the press release on this study, we assumed there was some circadian aspect to the research. But it appears that BF LEDs were simply a good match for the work because of the prevalence of the extremely-short-wavelength violet spectral energy.

The researchers had volunteers view several near-white LED sources with different spectral power distributions (SPDs) and were asked to compare those sources with a reference white source. “According to standard colorimetry methods, all users should have the same perception for a

certain LED source,” said David. “However, we found large variations between viewers. Some thought a given source appeared very pink, whereas others thought the same source appeared very green.” The research studied LEDs that were binned primarily on the 1931 CIE colour space work that is still widely used in the SSL world. The OSA research found a new colour-matching function called CIEPO06 based on a 6-10° field of view that could help with consistency of perception if applied in LED binning. Yet, the study also found a solid link between age and colour perception as well. The perceived tint of these unusual LED sources is heavily influenced by the viewer’s sensitivity in the violet range, which is strongly age-dependent. Although others have observed similar variations in white-LED perception, the effect was especially easy to see because these special LEDs exacerbate it.

Enquiries: www.osa.org



RETROFITTING AN OFFICE SPACE WITH LED LIGHTING: BENEFITS & OPTIONS



Many businesses are discovering the value of LED lighting. It can cut costs, increase productivity, and help the environment. However, it can seem like a big, intimidating project. There are a lot of light fixtures in most places of business.

LED Distributor ZLED says, “When you use a retrofit kit like our Magnilumen kit, it only takes a few minutes per fixture. A small office can be completed in an afternoon, and a building can be retrofitted in a few days.” If your fixtures are compatible with plug-and-play options, it can take even less time. Here are some of the benefits of making the switch and your options when you decide to execute.

BENEFITS OF RETROFITTING LED LIGHTING FOR OFFICE SPACE

Save money on energy and labour costs

Switching from fluorescents or incandescent bulbs to LEDs will save you money on your energy bills over time. However, you’ll save more money on labour costs. Fluorescents have to be changed every few years, and incandescent bulbs burn out even faster. You have to pay someone to swap out all of those bulbs. When you switch to LEDs, you can leave them alone for up to a decade without having to change them. This will likely save you the most money by cutting down on labour costs.

Create a safer and healthier workspace

Fluorescent lighting is dim and warm, and it flickers. It’s connected to headaches, eye strain, and even mental health conditions. The warm lighting of fluorescent tubes signals to the brain that it’s close to bedtime. Natural light is cool, and LEDs better mimic natural light, which helps us to remain alert throughout the work day. Providing workers with

cooler LED lighting can increase productivity and workplace safety, which is another way LEDs can save you money.

Increase the value of your property

Depending on the retrofitting option you choose, you could increase the value of your property. Switching out bulbs won’t do much, but swapping out old fixtures is a renovation that can add some value. Adding brand new fixtures is the most expensive option when switching to LED lighting, but it is the only option that will get you significant ROI in this way. Potential buyers will likely appreciate your efforts to swap old bulbs with LEDs, but the value of the building won’t increase anywhere near as much.

Help the environment

Switching to LED lights means you will use less electricity and create less waste. Many of their components are also recyclable. They last much longer than incandescent and fluorescent bulbs and require much less energy. If you’re wondering how LED lights save energy, MultiBriefs says, “LED bulbs consume less power per unit (lumen) of light emitted. This reduces greenhouse emissions from power plants. Carbon dioxide emissions for LEDs are also low. Roughly, one LED bulb will minimise greenhouse gas emissions by almost half a ton.”

LED RETROFITTING OPTIONS

Swap old bulbs for LED bulbs

In some cases, switching to LED light is as simple as replacing the bulb. Most home lighting fits into this category. If your office has a lot of desk lamps, you can simply swap out the bulbs. This is the cheapest option, but most office lighting doesn’t fit into this category.

LED retrofit in existing fixture

Most offices have fluorescent tube lighting, which is more complex than fixtures you find in your home. If you want to replace your fluorescent office lighting, you will likely need a retrofit kit.

These kits require some minor wiring that can be completed in a few minutes. Although the task is relatively simple, it’s best for someone experienced with electrical work to swap out the bulbs. The process will require some labour costs, but the bulbs will last for years after they’re installed. Plug-and-play options are available that don’t require any wiring work, but they are not compatible with all fixtures. If your fixtures are not compatible with plug-and-play bulbs, this is the cheapest option for replacing fluorescent tubes with LED tubes.

Replace fixtures

This option is only necessary if there is something wrong with your existing fixtures. It is by far the most expensive option. LED fixtures are very nice, but are bad for your wallet and for the environment to replace them if it isn’t absolutely necessary. Replacing perfectly good fixtures creates unnecessary waste.

Some examples where you would need to replace the fixture include if the fixture is damaged or completely enclosed. LED bulbs create heat that needs to be able to escape. If the heat can’t escape, it will damage the bulb and the fixture. The other exception is if you need a new fixture where one doesn’t already exist. If you need more light, you might as well install an LED fixture. Are you looking to improve office lighting? Have you researched if your existing lights are compatible with LED bulbs?

Enquiries: www.zled-lighting.com

INFRARED LEDs MAKE VIRTUAL AND AUGMENTED REALITY APPLICATIONS EVEN ‘MORE REAL’

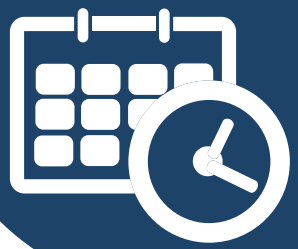
Virtual (VR) and Augmented Reality (AR) applications will become more widespread in the coming years. They have long played a central role in areas far beyond classic gaming. Various global players have used these technologies for training purposes or integrated them firmly into their daily work processes. As these applications become part of our everyday lives, some users are developing feelings of discomfort and dizziness when the virtual and real perceptions do not match. Osram’s new Firefly SFH 4030 and SFH 4060 help to prevent these side effects by enabling state-of-the-art eye-tracking solutions that provide a targeted point of reference, allowing users to safely immerse in other worlds.

Eye-tracking systems register the user’s viewing angle and the movements of his or her eyes. The systems illuminate the eyes with infrared light and register the reflections with a camera sensor. Software then determines the exact position of the eyes and the viewing direction of the user to derive relevant information for the imaging elements of the system.

The Firefly SFH 4030 and SFH 4060 feature compact dimensions of only 1.0 mm x 0.325 mm. Thanks to their low height of only 0.55 mm, the side emitting components can be easily installed. A special feature is the black cap, which makes the two IREDS ‘invisible’ when installed.

Enquiries: www.osram.com





UPCOMING INDUSTRY EVENTS

DEC

ORHVS course

2-6 December

H.V. Test training centre, Randburg

www.hvtraining.co.za

Cable Diagnostics course

9-10 December

H.V. Test training centre, Randburg

www.hvtraining.co.za

Cable Jointing and Terminations course

11-13 December

H.V. Test training centre, Randburg

www.hvtraining.co.za

Cable Fault Location course

17-19 December

H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

DATES TO DIARISE IN 2020

Gauteng Homemakers Expo

27 February-1 March

The Johannesburg Home Makers Expo celebrates the authenticity behind real homes and their beauty. Home is the very place where we laugh, we cry, we grow up and raise our children so it's no wonder that we all want to tell our stories through our decor and designs, mimicking the past, present and future between our four walls. The show will present the very latest in home renovation, interiors, soft furnishings, lighting, kitchens, furniture, and more. Meet leaders in the home lifestyle industry with exclusive insider tips and professional advice. The Expo features a significant amount of attractions to keep you informed and entertained including demonstrations by DIY celebs.

Internet of Things Forum Africa Exhibition

25-26 March

Internet of Things Forum Africa Exhibition is a highly anticipated conference, targeted at thought leaders, IoT ecosystem participants and experts in Africa, and will

create a platform for all players to share their knowledge of real-world IoT trends, challenges, and solutions. IoT Forum Africa will gather thought-leaders, solution providers and decision-makers from diverse industries. Past sponsors of IOTFA include BCX, MTN, Huawei, Schneider Electric, Software AG, Altech, Dimension Data, Grant Thornton, Dark Fibre Africa amongst many others.

The Solar Show Africa

31 March-1 April

The Solar Show Africa brings together thousands of industry professionals who want to share their ideas on the newest innovations on solar power generation and the entire solar value chain. The show maximises the learning through:

- Keynote speakers
- Regional project case studies
- Roundtable discussions
- On-floor seminars

Discover what are the top trends in the solar energy sector and what are the biggest opportunities thanks to a superior content on smart electricity: solar, nuclear, maintenance and asset management, coal, power distribution, energy storage, gas power, finance, investment and billing. And if you are going to exhibit, explore exciting technologies by networking and participating in live demos taking place on all the exhibition floors.

Power & Electricity World Africa

31 March-1 April

Power & Electricity World Africa bring innovators, disruptors and change agents together to talk and engage in healthy business pertaining to power and electricity. This serves as a platform for thought leaders and disruptors to showcase their solutions to Africa power and energy buyer community. This event focusses largely on creative, organic and customer-focused approach to bring new innovations in power industry.

Securex

2-4 June

Securex South Africa is one of the most important trade

fairs for commercial security and fire protection, which takes place once a year in Johannesburg. The exhibition sets new standards for the future and is therefore a must for many decision makers from the industry. The event attracts visitors and exhibitors from all over the country as well as top experts from around the world that are represented with pavilions at the fair. The visitors are able to inform themselves in detail and comprehensively on security, fire protection, energy and environment and on the latest developments, trends, services and products in the fields. Other topics include access control, biometrics, video surveillance, IP security and intelligent buildings. The goal is to merge the systems and strategies of all firms, so that the industry becomes more profitable, more efficient and a lot more effective.

A-OSH Expo

2-4 June

Occupational health and safety are important issues when it comes to the workplace. To address these questions and themes, the A-OSH Expo South Africa was created. She is a national trade fair for occupational safety and health at work and takes place annually in the Gallagher Convention Center in Johannesburg. The fair offers the perfect opportunity to talk with industry experts to gather information, share knowledge and provide critical questions about OSH. It is a platform for anyone who has to do with health and safety, even when it comes to the points of commitment, training and equipment. Visitors can discover and test the latest innovations, products and services from many leading companies. In addition, the fair is an important meeting place, to provide themselves with valuable contacts, to network with colleagues in the industry and to share ideas, opinions and best practices. The exhibition is accompanied by a conference, by first aid demonstrations and demonstrations of working at heights.

SAITEX

21-23 June

One of Africa's largest and most well-established trade exhibitions, SAITEX is an annual product sourcing opportunity for the entire continent's retail and trade industry. Africa

featuring electronics and home appliances, homeware and household products as well as building materials and tools.

Interbuild Africa

29 July-1 August

Interbuild Africa in Johannesburg is a trade fair for construction and an excellent platform for exhibitors to meet with new and existing customers, introduce new products, sign sales contracts, to strengthen their own brand, to interact with suppliers and to get information on events in the market. Visitors can find in depth and comprehensive information here about the latest developments, trends, products and services in various fields.

Electra Mining

7-11 September

Electra Mining Africa is the ultimate meeting and market place for all stakeholders involved in the mining, construction, industrial and power generation industries. It offers both exhibitors and visitors the opportunity to make valuable business connections, discuss the latest developments, technologies, trends, products and services in these sectors. Many new innovations are showcased including energy efficiencies and environmentally friendly products, as well as products in line with the mining industry's goals on health and safety. Electra Mining Africa is co-located with Elenex Africa (power generation, electrical engineering and lighting) and Transport Expo (construction and mining transport).

AFRIBUILD

13-15 October

AfriBuild is aimed at equipping the local building sector with the practical examples, demonstrations, skills, and advice needed for successful future development. The new expo will take place over three days, bringing together hundreds of local and global exhibitors – ranging from mechanical, electrical and plumbing (MEP) providers and tools, equipment and materials experts, to structure, occupational health and safety (OHS), and technology and innovation specialists – to showcase their expertise, products and services.

DOES CIRCADIAN LIGHTING WORK?

The potential of lighting to improve occupant health and well-being is increasingly attracting the attention of project owners and end users. In commercial environments, good design has become synonymous with talent hiring and retention.

"If you don't get the lighting right, it's not going to be an environment anyone wants to spend time in," says Elizabeth O. Lowrey, principal and director of interior architecture at Elkus Manfredi Architects. "It all goes back to making people feel good and look good." Clients are increasingly requesting and expecting lighting systems and applications that can support human health and well-being and make an impact on the circadian system," concurs Mariana Figueiro, director of the Lighting Research Center (LRC), where she is also a professor at its School of Architecture.

In response to demand, lighting manufacturers are launching new products that they allege to be attuned to our circadian rhythm. Yet the sceptical end user has to wonder: How much of this is marketing versus actual science?

What you can't see

Both daylight, courtesy of earth's 24-hour light-dark cycle, and electric light can drive our circadian system, our internal clocks that regulate daily behaviours and the timing of biological processes, such as the release of the hormones melatonin and cortisol, which help control our blood sugar and affect our energy levels.

Several characteristics of lighting, including quantity, spectrum, timing, duration, and distribution, determine its nonvisual effects on our bodies and minds. The influence can

be positive, but also negative if, for example, light is delivered at the wrong time. Think screen time on electronic devices before bed or in the middle of the night. The disruption of circadian rhythms has been associated with health problems such as metabolic diseases, depression, and some types of cancer.

Daylight, mimicked

Generally speaking, natural is best and lighting is no exception: Daylight is the ideal source for regulating the circadian system. However, people tend to spend most of their day in interior environments, the majority of which Figueiro believes are under-lit: "Due to restrictive energy codes, daytime light levels in buildings are often too low or at threshold for activating the circadian system," she says. "Even in open offices with many, large windows, workers do not receive enough daylight to stimulate their circadian system, due to factors such as season, cloud cover, desk orientation, and window shade position." Supplemental electric lighting is thus a necessity, and recent technologies have enabled and improved the ability of fixtures to work in tandem with daylight. For example, luminaires with integrated photosensors and automatic dimming can maintain consistent light levels regardless of fluctuations in available daylight. Advancements in LED technology have also fostered the creation of tunable white light systems, which mimic daylight patterns by adjusting correlated colour temperature (CCT) and brightness levels throughout the day.

"Many manufacturers have made claims of tunable white light fixtures [that can change in CCT] as circadian," says Keith Yancey, AIA,

principal at architectural lighting consultancy Lam Partners. "While there is clearly a perceptible difference in CCT, which can make spaces feel warmer or cooler, actually stimulating the nonvisual cortex requires increased light levels in order to be effective."

Though tunable fixtures may be worthwhile, Yancey cautions that increased lighting levels and sources rich in the blue spectrum (CCT exceeding 5000 K) can create eye fatigue and glare if not properly implemented. For lighting to achieve CS and still feel normal and comfortable to our eyes, he recommends focusing on the proper wavelength, and not simply providing high light levels or cooler colour temperatures.

The verdict

While research on the effectiveness of circadian-attuned light reveals several benefits, the bigger picture from a design standpoint is important. "Sleep regularity and quality are very well proven to be connected to mental and physical well-being, but it would be taking liberties to connect a healthy lighting diet directly to these results," Yancey says. "Light, while the primary time-giver to the body's master clock in the brain, is only one of many factors," which also include eating schedule, external stressors, and social stimuli – such as "Instagram at 1am – sleeplessness."

"Providing occupants with proper circadian lighting is similar to providing them with ergonomic chairs or flat-screen computer monitors," Figueiro says. "Offices with daylight are more valuable and can be sold or rented for higher value. The same can be established for offices with good circadian lighting."

Planning any training courses or events for 2020? Publicise them in the monthly *Sparks Electrical News* Industry Events page. Email the event details to sparks@crowne.co.za

PEN YOUR EVENT





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Saylen Govender
Technical sales representative

Cummins

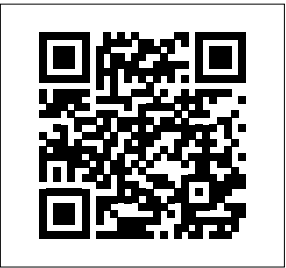
Warrick Gibbens
Power generation lead

Stone-Stamcor

Clinton Alexander
Storeman and internal sales

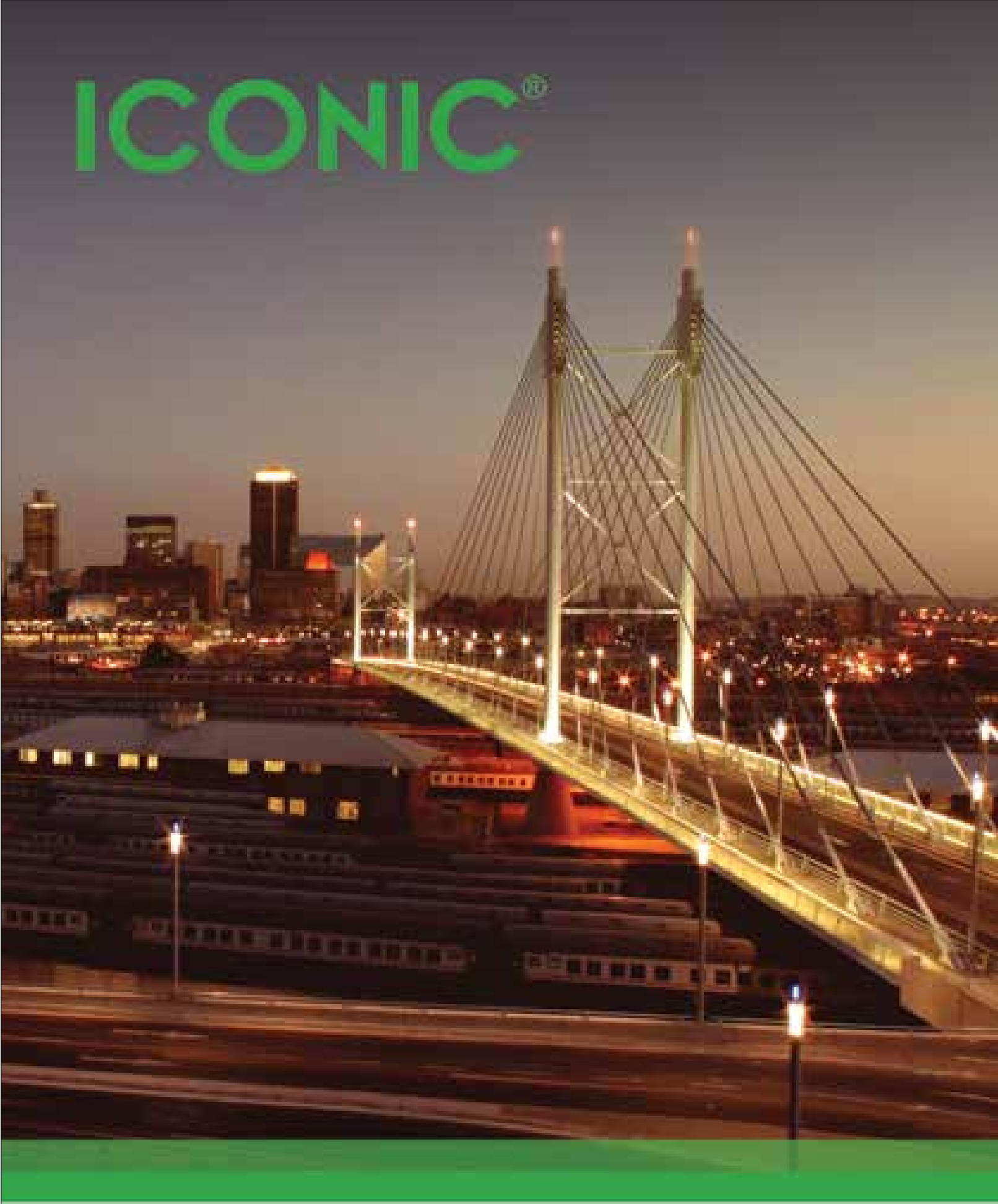
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A view of things to come.

www.sch.com/za

Life Is On



BRIGHT SPARK

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A truck is stuck under a bridge and the driver cannot get it out. A man walks by and stops to help. He easily gets the truck unstuck. How did he do it?

NOVEMBER SOLUTION

An earthworm

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