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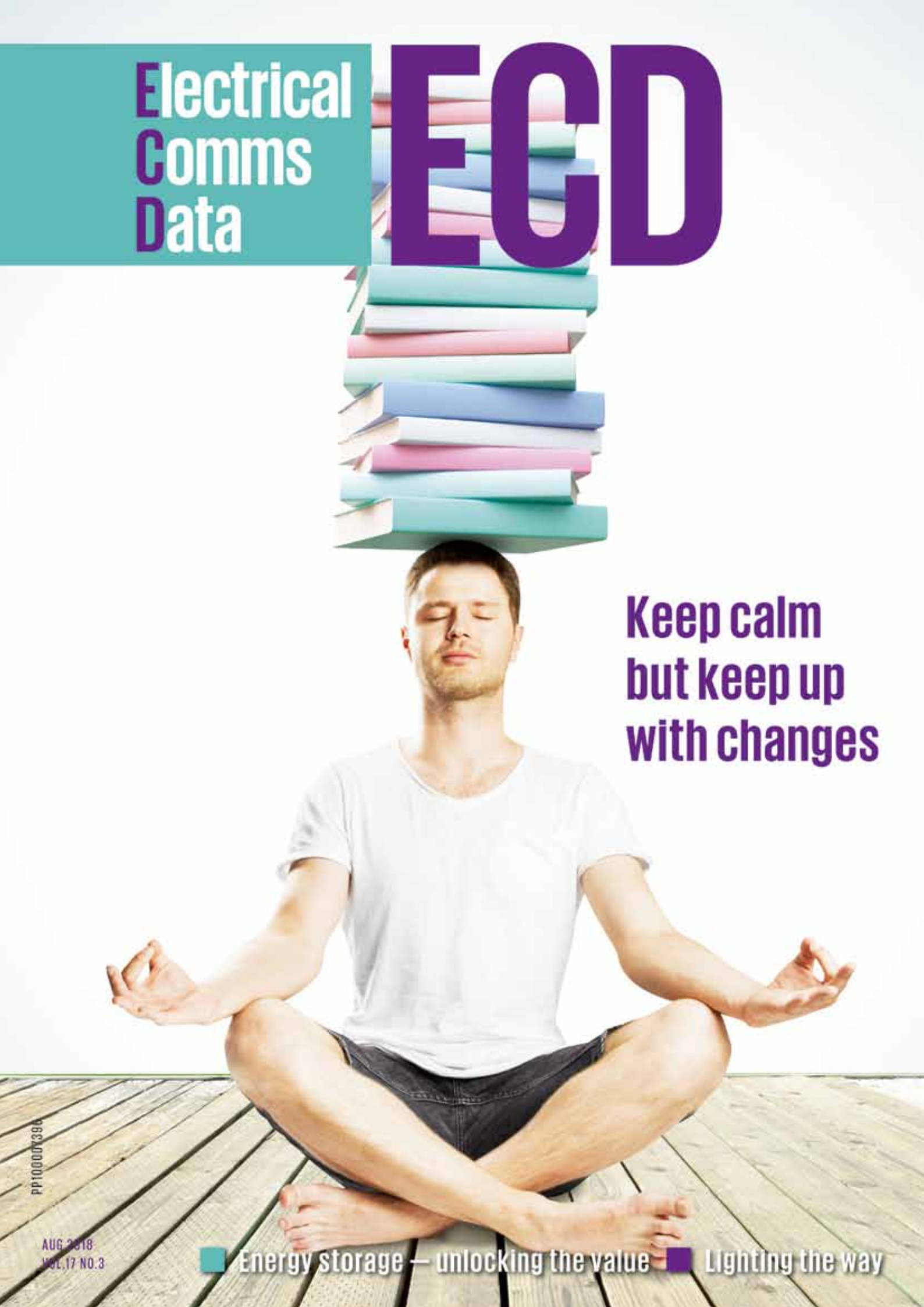

Keep calm but keep up with changes

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Energy storage — unlocking the value

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CONTENTS

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FROM THE EDITOR

The new edition of the Wiring Rules has finally been released. With over 200 changes, the latest edition of AS/NZS 3000:2018, Electrical Installations (Wiring Rules) is a complete revision of the 2007 edition and expands coverage on electrical installations, improves safeguards and brings industry requirements in line with best practice, according to Standards Australia.

Created through collaboration between industry and government, the new Wiring Rules feature key updates in important areas, such as main switches, residual current devices (RCDs) and DC wiring systems. Following illegal activity that resulted in an unauthorised pre-publication draft of the new standard being uploaded and circulated on social media, Standards Australia has cautioned all users to access only the official publication through official channels. The new standard is available in Australia from SAI Global.

Separately, the cabling standards and regulations are also being updated. AS/NZS 3080:2013 is set for a complete overhaul. The AS/CA S008:2010 (products) and AS/CA S009:2013 (installation) are also being revised. Another ICT-related standard being released internationally later this year is Power over Ethernet (PoE) – IEEE 802.3bt: 'DTE Power via MDI over 4-Pair cabling' (4PPoE). In the article on page XX, BICSI South Pacific CEO Paul Stathis provides detailed insights on the new ICT-related standards and regulations.

A number of other regulatory changes related to batteries, lighting etc are in the works. Dealing with an ever-changing regulatory landscape may seem overwhelming but it's important to keep up with changes. Non-compliance can result in serious consequences. This issue also features articles on power quality, new tools, battery systems and lighting. If there is any particular industry topic or regulatory change you'd like more insights on, please feel free to send me an email.

Mansi Gandhi – Editor
ecd@wfmedia.com.au

ENERGY STORAGE – UNLOCKING THE VALUE

*Dr Lachlan Blackhall**

Australia is in the midst of an energy revolution. Centralised, fossil fuel-fired electricity systems are transitioning to systems powered by renewable energy. But it is the extraordinary capabilities of existing and emerging energy and battery storage technology that underpin this renewable energy revolution.

When the first electric light was switched on at the Sydney Observatory in the mid 1860s, it would have been impossible to understand the electricity revolution that would eventuate in Australia. Almost 70 years ago, the current grid really started to take shape; a highly centralised design structured around centralised generators and fuelled by the plentiful and cheap supply of Australian coal.

Now, we can see the end of coal-fired generation in Australia; an outcome that will fundamentally change our electricity system forever. The changes occurring in the electricity grid today will ensure that we will never build another coal-fired generator.

The changing energy mix over the last two decades has been driven by developments in renewable energy generation, particularly in the deployment of large-scale wind and residential solar photovoltaics (PV). Currently, there are over 1.8 million residential household solar PV systems, the highest per capita deployment anywhere in the world. This number is set to double again by the mid 2020s.

To support existing and emerging renewable generation, there is now a strong focus on the role that energy storage broadly, and battery storage specifically, is going to play. The focus on energy storage is playing out in four key areas of our electricity system — residential battery storage, grid-scale battery storage, community-scale battery storage and system-scale energy storage.

Residential battery storage

The current interest in residential battery storage (in the tens of kW/kWh) emerged in 2015 as grid-connected batteries started to become widely available. The cost of these batteries was being driven down by the increase in electric vehicle production. This created opportunities for consumers to adopt lithium batteries alongside their solar PV to enable them to store the energy they generated during the day, and then use it in the evening when buying energy from the grid was more expensive.

So what is driving customers to adopt battery storage? In most cases, it is about addressing the rising cost of electricity — which has risen 63% over the last 10 years. In addition, many customers are keen to play a role in supporting more renewable generation as a means to reduce the CO_2 emissions that are contributing to climate change.

Uptake of residential battery storage predictions vary, but some are as high as 1 million residential battery systems by 2020. Progress towards this number has been modest: slowed by the economics of residential battery storage, and by the complications of installing and commissioning these new storage systems.

Reducing the complexity of installing, commissioning and operating residential battery storage systems is a crucial challenge for industry, one that will underpin the long-term success and interest in this type of energy storage.

Grid-scale battery storage

Alongside the adoption of residential battery storage, there is also increasing awareness and adoption of grid-scale, or utility-scale, battery storage systems. These batteries are often installed alongside utility-scale wind and solar farms around Australia. The best-known example of a battery like this is the 100 MW/129 MWh Tesla big battery which was installed in 2017 in South Australia. This battery installation, known as the Hornsdale Power Reserve (HPR), remains the largest lithium-based battery system currently installed in the world.

HPR won't be the only big lithium battery in Australia though. Many states are investigating how grid-scale battery systems can support increasing renewable energy generation whilst contributing to the stable and efficient operation of the broader

electricity system. Increasingly, these large-scale battery storage deployments will be selling energy and other services into the National Electricity Market (NEM), playing a key role in providing energy reliability and security for us all. The potential for this contribution is best highlighted by the HPR installation, which, since its installation, has provided a 55% share of a key stability service in the South Australian electricity market.

Lithium batteries aren't the only story though. While the price of lithium batteries continues to be driven down by increasing electric vehicle production, the power-to-weight ratio of lithium storage is less relevant for stationary batteries. There is interest in the advantages of other battery chemistries that have longer operating lifetimes.

We are likely to see a lot more vanadium flow batteries being installed over the years ahead. Vanadium flow batteries were first developed by Australian researchers over 30 years ago, but the cost to produce them is decreasing due to the demand for these batteries coming out of China.

Community-scale battery storage

In between residential and utility-scale storage, future opportunities exist for the wide-scale deployment of community battery storage systems (ie, batteries in the hundreds of kW/kWh). These systems could provide communal energy storage for up to 150 dwellings. While there have been limited community battery systems installed to date, the economics of community battery storage is dramatically improving and is occurring alongside increasing interest in community energy models in both rural and urban centres.

However, unlocking the value to the community of these battery systems is going to require some key regulatory changes. The most notable change required is to the structure of the network tariffs which determine the cost of transferring energy between households participating in these new energy communities.

The other key challenge is primarily logistical. Namely, where do you put these community storage systems? And who will own and operate them? Addressing these challenges will provide big opportunities to shake up the current landscape of the Australian electricity system.

System-scale storage

With all the media attention given to batteries, you could be forgiven for forgetting that Australia has had a long history of system-scale energy storage in the form of pumped hydropower.

Interest in this area has been reinvigorated with the activities surrounding the studies for what is being called Snowy 2.0 — a massive increase in the amount of pumped hydro energy storage that would be retrofitted into the existing Snowy Hydro Scheme. The Snowy 2.0 plan would add 2000 MW of energy storage capacity to the current Snowy Hydro Scheme and would come online in 2024.

Making it work

With the plethora of battery and energy storage capabilities outlined above, the question is not whether energy storage is going to play a role in our future electricity system but how significant that role will be. The challenge then becomes how we coordinate and orchestrate energy and battery storage to work as part of the broader electricity system and electricity market.

Addressing this challenge, and unlocking the value of energy and battery storage, is consuming the attention of many in the energy industry at the current time. The market operator, regulators and electricity networks are all actively engaged in solving this problem and new capabilities like virtual power plant (VPP) technology are in the process of being deployed.

Energy and battery storage will play a vital role in ensuring we have a reliable and secure supply of energy, while reducing electricity costs for both residential and industrial customers alike.

Storage will underpin the renewable energy revolution, and now is the time to take advantage of this opportunity.

Dr Lachlan Blackhall holds a BE, a BSc and a PhD and is an Entrepreneurial Fellow and Head of the Battery Storage and Grid Integration Program at The Australian National University in Canberra, Australia. Dr Blackhall was the co-founder and former chief technical officer of Reposit Power, where he pioneered the development of distributed control systems to monitor, optimise and control grid-connected energy storage, as well as the development of virtual power plant technology to aggregate distributed energy storage to deliver services and capabilities to energy networks, markets and utilities. He is a Senior Member of the Institute of Electrical and Electronics Engineers and a fellow of the Australian Academy of Technology and Engineering.

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NECA AND MEA SIGN MoU

The National Electrical Communications Association (NECA) and Master Electricians Australia (MEA) have entered into a memorandum of understanding (MoU).

While the details of the agreement haven't yet been revealed, according to a joint statement issued by MEA and NECA, the two organisations will collectively explore better ways to represent and be the single voice of a united industry.

"Both organisations have worked tirelessly to advance the interests of their members and industry, to improve safety standards and statutory compliance for contractors, their employees, their customers, supply chain partners and the community. Both organisations continue to provide services to their respective members, including technical support, training and business advice. The organisations — through their members, Registered Training Organisations and Group Apprentice Schemes — also support the largest cohort of Electrical Apprentices in Australia.


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"In recent years it's become clear that the industry would benefit from having a stronger and united voice as well as providing a more comprehensive suite of services to members. As a result, both NECA and MEA have listened to their respective memberships and have entered a memorandum of understanding.

"These talks have been led by the two organisations' national presidents — Alan Brown for NECA and Tony Arnold for MEA. The discussions to date have been focused on a single goal — to deliver a better deal for members. While the process is ongoing, there are a number of core principles guiding these discussions. These principles include:

- Keeping the best interests of all members at the absolute forefront of what we do;
- Respecting the extensive history of both organisations;
- Understanding the different needs and expectations of the two memberships;
- Harnessing the power that combined advocacy to government would create;
- Appreciating the high-quality staff employed by both organisations and their tireless commitment to serving members and the broader industry;
- Providing the best possible deal for members, including the services and expertise of both organisations being made available to all members;
- Providing the highest quality apprenticeship services to the industry;
- Ensuring that the next generation of contractors is well represented; and
- Recognising the huge opportunities in combined industry and networking events.

"The final outcome of these discussions is still to be determined. However, there is considerable goodwill on both sides and we are confident that we can agree on a strong platform, and a united voice, all of which will result in a more prosperous and sustainable future for Australia's electrical contracting industry. We will keep members informed as the discussions progress," the statement said.


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KATKO, GRACE APPOINT APS INDUSTRIAL AS DISTRIBUTOR

Switch manufacturer Katko has appointed APS Industrial as its master national distribution partner. The agreement, which came into effect on 1 July, further strengthens APS Industrial's ability to fully service Australian industry with a broad portfolio of industrial low- and medium-voltage electrical and automation products,.

Based in Finland and with manufacturing facilities both there and in Poland, Katko's products are sold in over 70 countries (and six continents) around the world.

David Hegarty, Managing Director of APS Industrial, said Katko is committed to designing products and solutions tailored to a range of industry needs, and these are values that very much align with APS Industrial.

"Using these synergies as the foundation of our partnership, we are very excited by what we will together be able to provide Australian industry through this market-leading range of switches and switching solutions," said Hegarty.

Separately, US-based Grace Engineered Products, a provider of electrical safety product solutions, has also appointed APS Industrial as a national distributor.

The deal will see APS bring to market a complete range of permanent electrical safety devices (PESDs), led by the GracePESDs range of voltage indicators and the GracePort range of communication ports.

"The Grace Engineered distribution agreement forms a very nice addition to our growing product portfolio and will particularly appeal to switchboard and control panel builders. These quality voltage indicators, test points and combination PESDs promote a safe work environment and save lives," said Hegarty.

"In addition to local stockholdings we can also draw on the required technical expertise to support these ranges — it's another exciting outcome that is designed to better serve local customers with highest levels of customer service and delivery."

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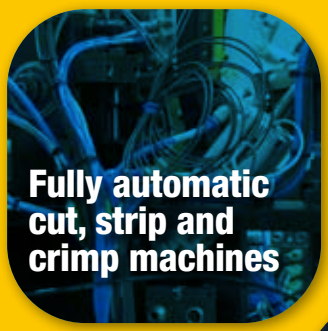

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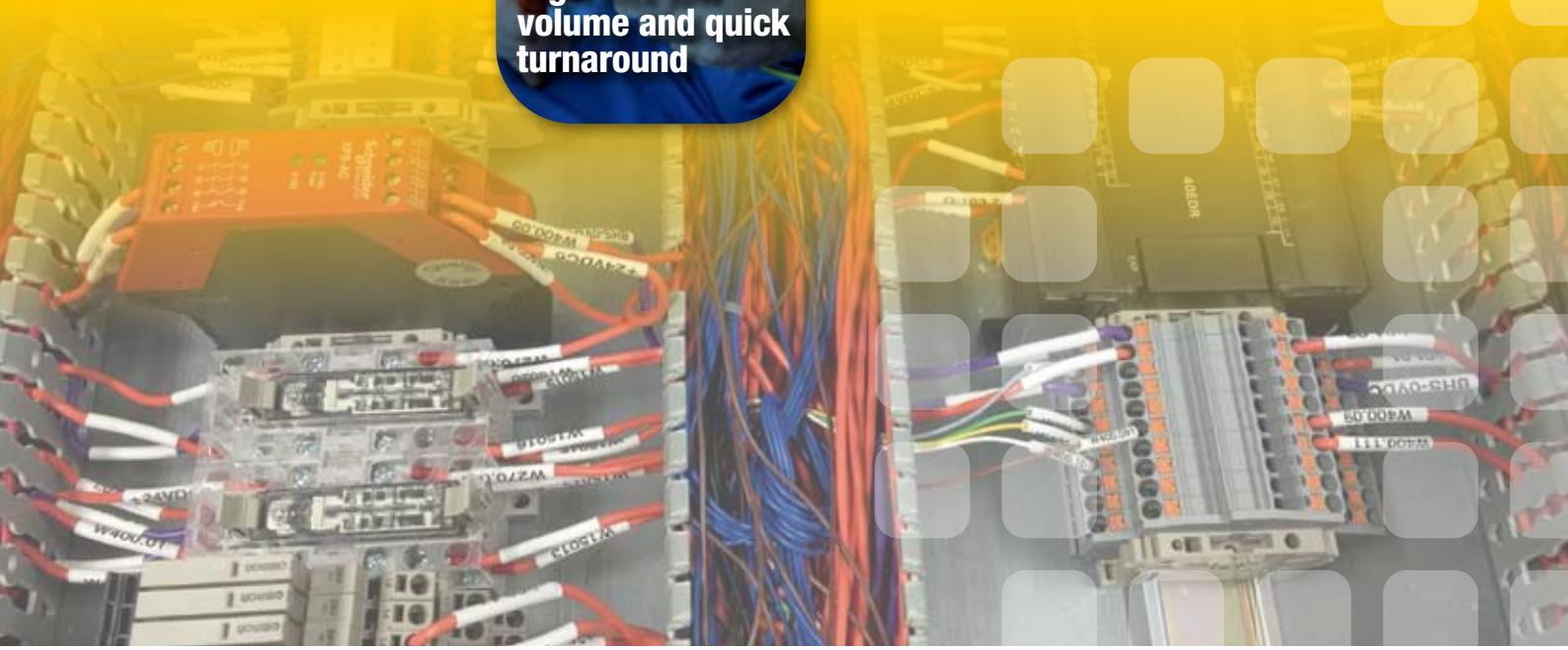

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ROADMAP TO DRIVE SMART BUILDINGS MARKET

The Green Building Council of Australia's 'Carbon Positive Roadmap' will drive the smart buildings market, according to Smart Cities Council Australia New Zealand.

Developed in close consultation with industry and government, the discussion paper establishes the steps required for commercial, institutional and government buildings and fit-outs to decarbonise. It outlines the high-level outcomes, actions, targets and policy positions required. These are proposed alongside changes to the GBCA's Green Star rating tool to ensure it helps lead industry through the next decade of transformation.

GBCA Chief Executive Romilly Madew said the roadmap has been developed to help ensure Australia's competitiveness and attractiveness for investment while fulfilling international commitments to reducing carbon emissions.

"This roadmap was developed as a response to GBCA's vision of healthy, resilient and positive places for people and the natural environment and is the result of extensive industry and government consultation and engagement," said Madew.

"It proposes a range of policy positions for industry to support and calls for upgrades to energy efficiency requirements in the national construction code and an expansion of requirements for the mandatory disclosure of energy efficiency in buildings and fit-outs. Broader reforms in the energy sector are also discussed, with practical incentives to support building upgrades and retrofits and the development of carbon neutral products and services.

"As a signatory to the Paris Climate Change Agreement and the UN's 17 Sustainable Development Goals, the Australian Government's continued support is needed to bring carbon emissions down.

"Our roadmap supports the work of the World Green Building Council, which earlier this month launched its Net Zero Carbon Buildings Commitment, and means we are leading the emissions reductions charge, as one of only five Green Building Councils to have a net zero carbon buildings certification scheme in place.

"Whether you are a developer, building owner, industry professional, product manufacturer, building occupant or policymaker, this roadmap will help you lead in the delivery of a more sustainable built environment," said Madew.

The roadmap proposes a significant increase in performance for buildings and fit-outs over the next decade. It is being developed in tandem with Green Star Future Focus — a comprehensive review of existing Green Star rating tools to set leading targets for certification.

Buildings seeking a Green Star rating would have to meet updated requirements — with a proposal that new and existing Green Star rated buildings will have no greenhouse gas emissions by 2030 and existing buildings having to meet this target by 2050 or earlier.

CONTROL LOGIC PARTNERS WITH TOSIBOX

Control Logic has partnered with Finnish company TOSIBOX to exclusively distribute the latter's products in Australia.

The company offers easy and secure remote access through a secure VPN connection that is both reliable and scalable. Using patented Plug & Go technology, TOSIBOX is said to allow users to build a secure network in under five minutes. Using a direct VPN tunnel between devices, only trusted devices can access the network through a physical key to deliver military-grade security that sets the standards of remote connections. The range is scalable to enable real-time data collection and provides an easily expandable solution.

Lee Papadimitrious, General Manager – Products and Marketing at Control Logic, said TOSIBOX products negate the need for the traditional resource overheads required to maintain remote access solutions. "This truly is a game changer for anyone seeking a remote connection to their assets," he claimed.

MADE DOWN UNDER

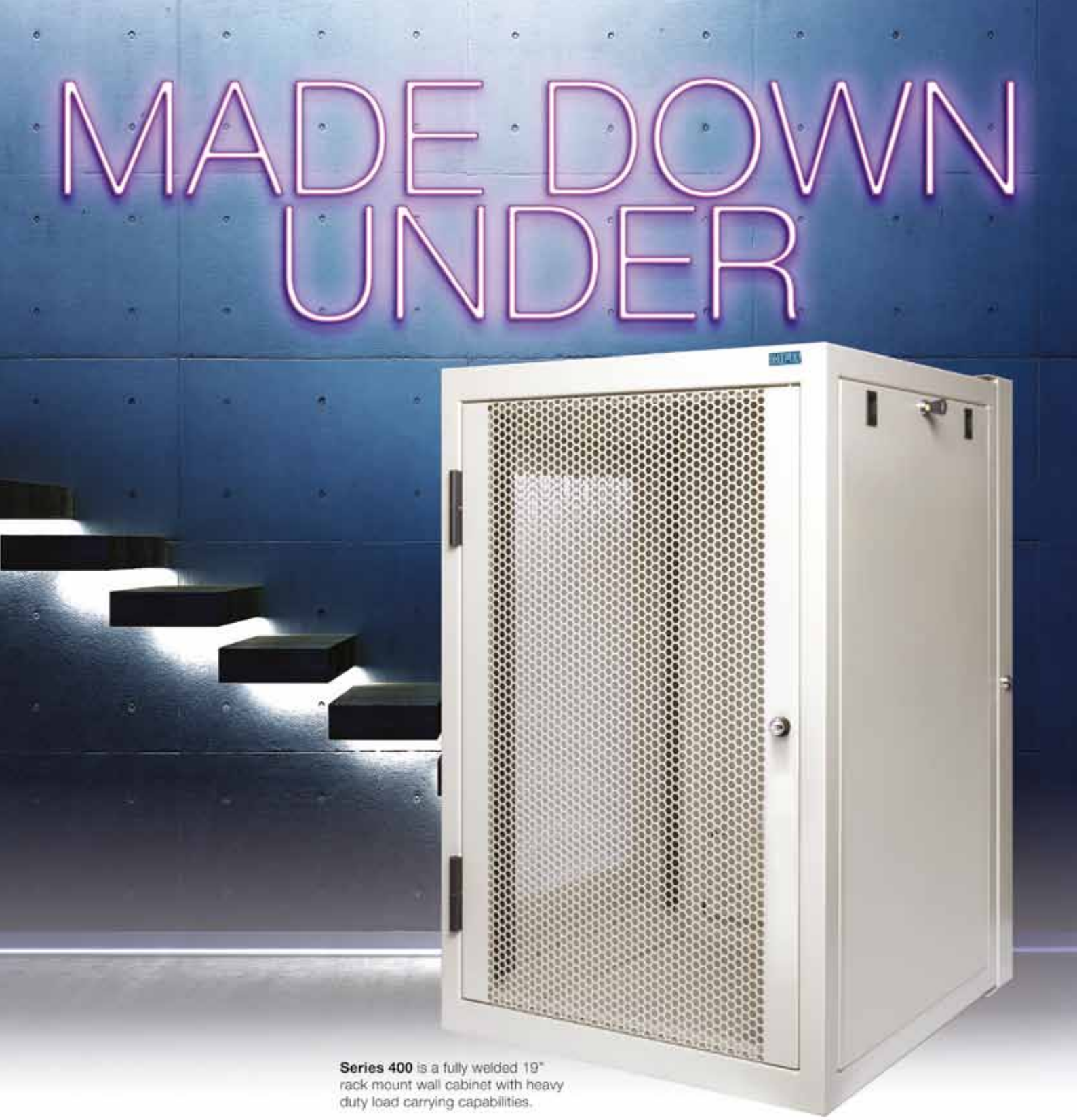

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ABB TO UPGRADE NZ HVDC LINK

Transpower New Zealand has appointed ABB to upgrade the high-voltage direct current (HVDC) link which interconnects the transmission grids of the North and South Islands.

The link is a vital element of the country's transmission system and is used as an energy-balancing system between the two islands. The ABB Ability MACH control system, which acts as the brain or nerve centre of the link, will be a key component of the upgrade.

The North Island houses more than three times the population of the South Island which, besides its picturesque landscape, offers vast amounts of hydropower. As a consequence, demand for power on the North Island is substantially higher and relies on power generated on the South Island. The >600 km-long North-South HVDC interconnection facilitates efficient transmission of clean power to areas of high demand. The link also plays an important role in the New Zealand electricity market by allowing power trading between the two islands.

ABB has historic involvement in the link. The first New Zealand link was commissioned by ABB (erstwhile ASEA) in 1965 as one of the first HVDC transmission systems in the world. It was originally a bipolar 600 MW link with mercury arc valves, until the original equipment was paralleled onto a single pole in 1992 and a new thyristor-based pole was commissioned by ABB alongside it, increasing capacity to 1040 MW. The first installation was decommissioned in 2012 after 47 years in operation.

The scope of the project includes a valve upgrade of pole 2 consisting of capacitors, fibre optics and valve control units based on the latest ABB Ability MACH control system. The upgrade, to be finalised in 2020, will be carried out in a manner that minimises impact on the grid and the power-trading market.

EUROPE GIVES REGULATORY PUSH TO FIBRE INVESTMENTS

The European Parliament and the Council have reached a political agreement to update the EU's telecoms rules.

The new European Electronic Communications Code, proposed by the European Commission, will boost investments in very high capacity networks across the EU, including in remote and rural areas.

Andrus Ansip, Vice-President in charge of the Digital Single Market, said, "This agreement is essential to meet Europeans' growing connectivity needs and boost Europe's competitiveness. We are laying the groundwork for the deployment of 5G across Europe."

Mariya Gabriel, Commissioner for Digital Economy and Society, said: "The new telecoms rules are an essential building block for Europe's digital future. After several months of tough negotiations, we have agreed on bold and balanced rules to provide faster access to radio spectrum, better services and more protection for consumers, as well as greater investment in very high speed networks."

The agreed rules are crucial for achieving Europe's connectivity targets and providing everyone in the EU the best possible internet connection, so they can participate fully in the digital economy.

The FTTH Council Europe welcomed the new code, which promotes competitive investments in futureproof digital infrastructures like full fibre and 5G.

"Today, the co-legislators paved the way towards a long-term competitive market structure by creating a favourable environment for all investors — both traditional and new — to play an active role in building our digital highways," said Ronan Kelly, President of the FTTH Council Europe.

For the first time, investment in very high capacity (VHC) networks is becoming a legally binding objective of the regulatory framework alongside competition, the creation of the single market and consumer benefits, said the Council in a statement. This new code marks a shift compared to the previous regulatory framework as it addresses the urgent need for step-change infrastructure investments in Europe and supports the evolution of the telecom market towards a long-term competitive structure. Even more importantly, the parameters defining the VHC networks will be built on the characteristics of fibre, the statement said.

"There is clearly a momentum for fibre investment," said Erzsébet Fitori, Director General of the FTTH Council Europe. "We see a lot of the emerging wholesale-only vehicles backed by new types of investors and now there is also more room for step-change investments made in a safeguarded competitive structure to be governed by a commercially driven scheme. There is opportunity in the new code for full fibre investors and a win-win for end users, who will benefit from fibre-based connectivity and long-term competition."

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NEW CABLING STANDARDS — WHAT YOU NEED TO KNOW

Paul Stathis, CEO, BICSI South Pacific

With a number of new cabling standards primed for release this year, 2018 will be a big year for the ICT industry.

Some standards are mandatory, others are voluntary, but all are equally applicable to the Australian ICT market. This article discusses which applicable standards are being released this year and why you need to adhere to them.

Cabling regulations

Australia's primary cabling regulations are AS/CA S008: 2010 (products) and AS/CA S009: 2013 (installation). It's important to adhere to these because they're mandated by the Australian Communications and Media Authority (ACMA). The ACMA can impose hefty fines for non-compliance — as much as $90,000. For more information on consequences of non-compliance, read 'What happens if I do not comply with the Telecommunications Act or the CPRs?' on the ACMA website.

Both of these regulations are jointly being revised in order to harmonise their content from this year onwards. Previously, they were updated independent of each other and occasionally one presented information that was out of sync with the other. The revisions are close to being completed, and both regulations are expected to be published in late 2018. Upon completion, both documents will be released for public comment, followed by a secondary revision to capture industry comments. Once finalised, both documents will be reviewed by the ACMA, which is expected to mandate them under the Telecommunications Cabling Provider Rules 2014. They can then be downloaded from http://www.commsalliance.com.au/Documents/Publications-by-Topic/Cabling.

Below are some of the changes to be included in S008:

- Telecommunications Network Voltages SELV, TNV-1, TNV-2, TNV-3 will be redefined as ES1, ES2, ES3, coinciding with the ACMA's migration of its telecommunications customer equipment safety standard AS/NZS 60950-1 to AS/NZS 62368-1 (see below)
- Introduction of one-pair cable and connectors
- Revised labelling requirements for fibre-optic enclosures
- A new 'fitness-for-purpose' requirement to ensure what's provided will actually do what it's supposed to do
- Defining 6-position plug compatibility with 8-position jacks
- Revised underground conduit markings and pit criteria
- Introduction of remote power feed requirements.

Some of the changes to be included in S009 are:

- Redefining the network boundary to address new versions of the NBN introduced since S009: 2013
- Defining the maximum length of outdoor cabling that can come into a building before it must be transitioned to indoor-rated cabling
- Permitting certain modular plugs to be terminated in the field and what is and isn't acceptable
- Further clarification on "fixed and concealed cabling" criteria
- Defining Earth Potential Rise (EPR) zone hazard distances
- Post-installation fibre labelling requirements
- Requirements for penetrations through fire-rated barriers
- Requirements for fitting jacks on moveable fixings (eg, pendants).

Another major regulatory change this year is the replacement of AS/NZS 60950-1 — the ACMA's mandated telecommunications customer equipment safety standard — with AS/NZS 62368-1.

This requires the ACMA to amend both the Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015 (the legal 'Instrument') and its Section 376 Telecommunications Technical Standard (Requirements for Connection to an Air Interface of a Telecommunications Network – AS/CA S042) 2015 that mandated AS/NZS 60950-1. The new Section 376

standard is expected to be called the 'Telecommunications (Customer Equipment Safety) Technical Standard 2018' and will mandate AS/NZS 62368-1:2018 – Audio/video, information and communication technology equipment Safety requirements.

At the request of industry, the ACMA has agreed to a four-year transition period. The suppliers can choose to comply with either AS/NZ 60950-1 or AS/NZS 62368-1 during the transition period.

Australian cabling standards

The AS/NZS 3080: 2013 — the cornerstone ICT infrastructure standard in Australia and New Zealand — is set for a complete overhaul. It's been a local adaptation of the international ISO/IEC 11801 standard, but has retained the long-standing 3080 label. As of this year, however, the name will change to AS/NZS ISO/IEC 11801. But it's more than just a name change. ISO/IEC 11801 underwent a major revision last year and its content and structure will apply here too.

For starters, instead of just one volume, it will be split into six separate 'environment-based' volumes:

- AS/NZS 11801-1 General requirements
- AS/NZS ISO/IEC 11801-2 Office premises
- AS/NZS ISO/IEC 11801-3 Industrial premises
- AS/NZS ISO/IEC 11801-4 Homes
- AS/NZS ISO/IEC 11801-5 Data centres
- AS/NZS ISO/IEC 11801-6 Distributed building services

Notably, each of these environments will have different performance criteria. For example, Class E will be the minimum twisted-pair cabling requirements in Office Premises; Class EA will be minimum for Data Centres and Distributed Building Services; while Class D will be the minimum for Homes and Industrial Premises.

Each of these environments will also have their own cabling 'architectural hierarchy', some quite distinct from the current architecture. AS/NZS 3080 calls for Campus Distributor connected via backbone cabling to Building Distributors, connected via backbone cabling to Floor Distributors, connected via horizontal cabling to Telecommunications outlets (TOs) and/or Consolidation Points (CPs). AS/NZS ISO/IEC 11801 introduces new terminologies and levels, so a cabling system could now include Distributor 4 to Distributor 3 via Subsystem cable 4, Distributor 3 to Distributor 2 via Subsystem cable 3, Distributor 2 to Distributor 1 via Subsystem cable 2, Distributor 1 to CP via Cable Z and CP to TO via cable Y. Confused? Refer to the explanatory diagrams in the standard.

AS/NZS ISO/IEC 11801 also introduces Category 8 twisted-pair cable and connectivity, and more detailed support for remote powering and distributed building services, particularly intended to support IoT applications. And for the same reason, it also introduces the much-anticipated '1-pair Ethernet' model, including a brand new 'non-RJ' type of connector. At the time of writing, the CT-001 committee that produces the AS/NZS cabling standards were voting on the connector types proposed by various manufacturers. The result from that vote is then submitted to the ISO/IEC committee as a single vote towards the decision on which connector type becomes the standard.

AS/NZS ISO/IEC 11801 also replaces OS1 Single-mode fibre with OS1A as a '3-window' fibre and introduces Wide Band Multi-mode fibre as OM5. This will be similar to CWDM in multi-mode and will support multiple wavelengths to deliver at least 28 Gbps per wavelength and 100 Gbps per fibre over 100 m.

International standards

One of the most anticipated ICT-related standards being released internationally this year is Power over Ethernet (PoE) – IEEE 802.3bt: 'DTE Power via MDI over 4-Pair cabling' (4PPoE). Expected to be released in late 2018, the standard introduces three new PoE 'types':

- Type 3 for up to 30 W over 2-pairs;
- Type 4 for up to 60 W over 4-pairs; and
- Type 5 for up to 90 W over 4-pairs.

While IEEE 802.3bt will have huge impacts in many fields, its major impact on cabling will be having to carry constant current of around 500 mA per conductor on cabling that was only ever designed for 'burst energy' — ones and zeros. That's up to 4 amps per 4-pair cable! Concerns emerging from this are heat dissipation from cables carrying considerable current and arcing at connectors when unmating plugs under load. The standard therefore introduces two sets of values for temperature rise for cabling — (1) in open air and (2) in sealed conduits, noting the impact of both cable construction and bundle sizes on temperature rise. It also calls for measures to minimise arcing at connectors.

Cabling manufacturers are addressing these issues in their products, so we don't expect a lot of problems emerging here, so long as PoE-rated products are specified and used.

It could, however, be a concern where PoE is run over existing cabling that may not be capable of supporting constant current. While we don't anticipate fires starting everywhere from overheated cables, it's more likely that applications on PoE circuits — surveillance cameras, wireless access points, intercoms, PA systems, AV networks, access control systems, intercoms — will fail.

Industry has jumped ahead of standards in this instance, with tester companies identifying DC resistance unbalance as a prime parameter to determine a cabling system's suitability to support PoE. This parameter is yet to be included in cabling standards, but it's recommended that DC resistance unbalance testing be conducted on any cabling anticipated to carry PoE to determine if it can support PoE.

This is just an overview of the major ICT infrastructure standards being released this year. Our advice is to watch for the public comment announcements of these standards, obtain copies to review and perhaps comment on them. It's important to get familiar with the changes, in order to know what to list in specifications or tender submissions.

Specify correct standards

Earlier this year, BICSI South Pacific conducted industry-wide research on standards and was amazed at the number of specifications that listed out-of-date and conflicting standards, and tender responses that claimed compliance to irrelevant or non-existent standards. This confirmed suspicions that some in our industry have little knowledge about standards and perhaps rely too much on assumed 'common-sense'. But the compelling reason to know and use correct standards isn't to displace assumed common-sense. Rather, it's to protect yourself from costly commercial errors.

> WE ALL KNOW THAT NON-COMPLIANCE WITH MANDATORY REGULATIONS LIKE AS/CA S008 AND S009 WILL LEAD TO LEGAL RISKS AND RESULT IN FINES.

We all know that non-compliance with mandatory regulations like AS/CA S008 and S009 will lead to legal risks and result in fines. That's Common Law. But many are ignorant of the implications of not complying with standards under Commercial Law. Standards like AS/NZS ISO/IEC 11801 and IEEE 802.3bt aren't mandatory, but when they're written into specifications and commercial parties sign agreements on the basis of those specifications, they become laws.

So, if you've written a specification that makes erroneous standards references, it opens the door for the other party to challenge the validity of your commercial agreement if a dispute emerges, which might be just a variation. Even if the dispute has nothing to do with standards, it's a weakness in the contract that any commercially savvy person could use against you as leverage.

Conversely, if you've responded to a tender blindly stating compliance to standards you know nothing about, you risk taking on liabilities far greater than you're capable of handling. A commercially savvy client could force you to deliver on that specification at your loss. Sadly, some contractors have experienced huge losses on projects because they agreed to terms they didn't understand.

Perhaps the most misunderstood commercial reality we're all exposed to is subrogation. This is a legal framework commonly used by insurance companies to recoup money they've paid on insurance claims. The Cambridge Dictionary defines subrogation as: "the ability that an insurance company has to get the money it has paid to a customer back from the person who caused the accident, damage, etc." It enables them to apportion percentages of the blame to many parties and then litigate against them. For example, if an insurance company paid out on losses from a building fire that was identified to have been caused by an electrical failure, they could legally chase the contractor, engineer, manufacturer and supplier for damages, even though they didn't cause the fire.

This is a complex matter that goes well beyond the scope of this article. We suggest you find out more about this from your insurance provider to better understand your risks. The message is simple — the application of correct and accurate standards mitigates risk:

- If you're writing specifications, make sure you call up the correct editions of the standards, and avoid quoting conflicting ones. Get familiar with them and discuss them with your colleagues and peers so you know exactly what you're calling for to be provided for your clients.
- And if you're responding to cabling specifications, check that the correct standards are quoted. If you find they're either out of date, incorrect or conflicting, flag it in your tender response or quote.

BICSI South Pacific
www.bicsi.com.au

Power supplies

The PULS Dimension CP range of low-voltage power supplies, distributed by Control Logic, range in power from 5 to 20 A.

The advanced electronics in the range has unity power factor that emits minimal heat loss and has low inrush current. Features include: a three-year warranty, an operating temperature of -25 to +70°C, remote shutdown capabilities and variants that include conformal coatings, medical approvals and wide AC/DC input voltages to cater for the transport industry.

The range is said to be able to provide five times the current limit in short bursts for solenoids and to ensure high inrush current devices can deliver, while the smart self-protecting Safe Hiccup Overload Recovery and Easy Fuse Breaking feature protects adjacent circuits from voltage dips during overcurrent load faults and shorts.

Control Logic Pty Ltd
www.control-logic.com.au

Field service solution

The Librestream Onsight platform, available from Olympus, allows users to share live visuals from remote visual inspections (RVI) and non-destructive testing (NDT) instruments with remote experts for rapid decision-making in the field.

The Librestream solution includes Onsight Connect collaboration software and the Onsight 400R Collaboration Hub device to connect to Olympus videoscopes, ultrasound and other test instruments. Olympus can also provide options to connect a variety of virtual reality headsets in order to share visuals in live 3D.

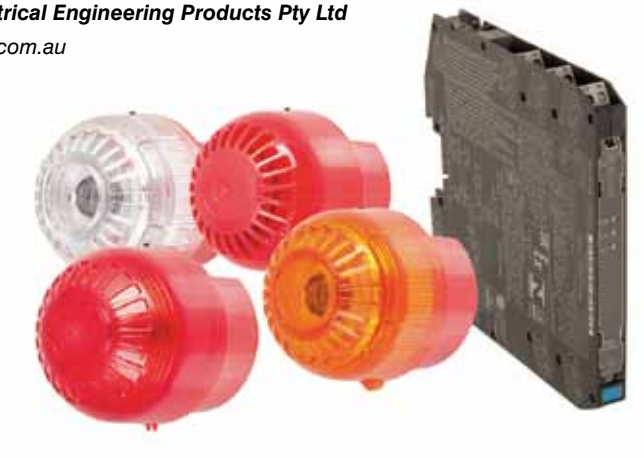
Olympus Australia Pty Ltd
www.olympusaustralia.com.au

Intrinsically safe signalling products

The Moflash range of low-power, high-output, intrinsically safe signalling products consists of a sounder which is 24 VDC with a 105 dB output, a beacon which is 24 VDC with nine bright LEDs for high visual output and the sounder/beacon combination unit. These devices are suitable for all hazardous environments and also come with Group I certification for use in underground mining.

The products are ideally paired with the corresponding intrinsically safe barrier from GM International to create an easy, off-the-shelf KIT solution for all signalling needs. Available in a range of colours, this solution is rated for hazardous zones 0, 1, 2, 20, 21 and 22 in IIC (Gas) and IIIC (Dust) environments. In addition, they are T5 and T6 temperature rated, making them a suitable alternative to their heavy-duty Ex d Flameproof counterparts.

NHP Electrical Engineering Products Pty Ltd
www.nhp.com.au



Digital multimeter with remote display

The Fluke 233 Digital Multimeter features a removable display which gives the user flexibility in unusual measurement scenarios. It is available to rent from TechRentals.

Users can simply put the meter where measurements are required and place the display where it can be seen easily. This functionality eliminates the need to juggle leads and the meter while reaching into confined spaces.

With a range of 10 m, the removable display allows for measurement in hard-to-reach spaces and machines or panels that are physically separated from a limit or isolator switch. It can also be used in environments unsuitable for operators such as clean rooms or hazardous areas.

The product features True-RMS AC voltage and current for precise measurements on non-linear signals. It can measure up to 1000 V AC and DC, up to 10 A (20 A for 30 s), and has a capacitance range of 10,000 μF.

TechRentals
www.techrentals.com.au

100G universal module

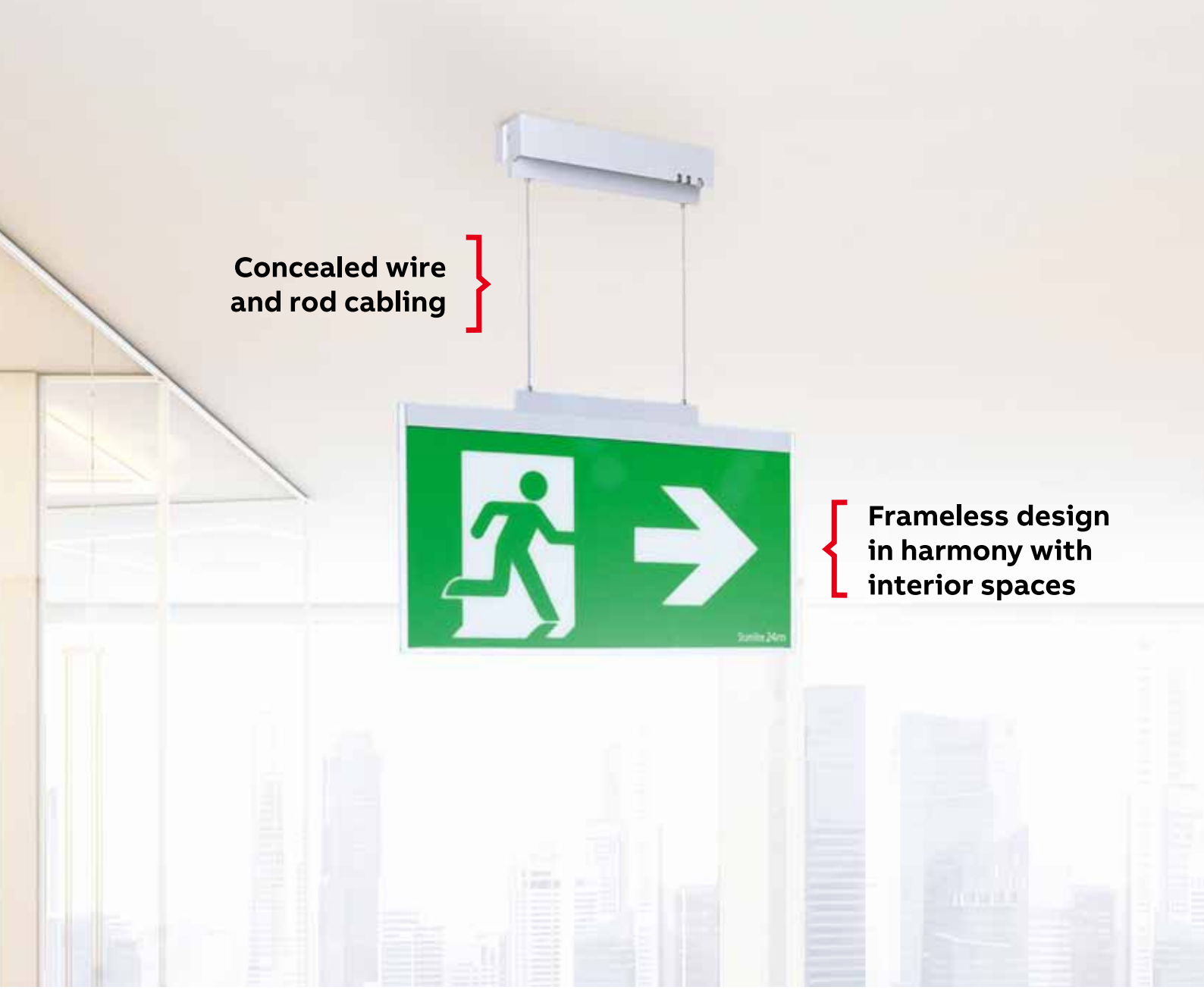
The VeEX -RXT-6200 100G Universal Module is equipped with dual next-generation optical transceiver ports and optional legacy test interfaces. It complements the RXT Platform, extending its testing range to 100 Gbps and offering up to two independent tests.

Installation, commissioning, monitoring and maintenance tasks are simplified thanks to a combination of intuitive features and powerful test functions. Novice users benefit from the easy-to-use GUI, while experienced users will appreciate an array of advanced features such as OTL/PCS, CAUI-4/XLAUI Lane BERT, overhead monitor/control, tandem connection monitoring, service disruption, protocol capture/decode, BERT and throughput test.

Module highlights include independent dual-port testing, up to 2 x 112G; CFP4 (LR4 & SR4) and QSFP28 interfaces for 100GE, OTU4 and 50GE applications; supports IEEE 802.3bj Clause 91 RS-FEC as required for SR4; QSFP+ for 40GE, OTU3; SFP28 interface for 25GE, 16G FC, 32G FC and 24G CPRI applications; SFP+ for 100Base-FX, 1000Base-X, 10GEBase-X, OTU2/2e/1e/1, STM-64/16/4/1/0, OC192/48/12/3/1, and fibre channel 1/2/4/8/10/16G and CPRI up to 12G applications; RJ45 for 10/100/1000Base-T applications; external clock interfaces; and 150 ppm clock offset generation.

Ethernet testing features include optical 100 Mbps to 100 Gbps Ethernet testing, including 25GE and 50GE; electrical 10/100/1000 Mbps Ethernet testing; dual-port testing capabilities; optical Lane BERT and CAUI-4/XLAUI Lane BERT; PCS Layer Testing with Skew generation/monitoring; multi-stream testing up to 32 independent streams; IEEE 802.3ah, ITU-T Y.1731, IEEE 802.1ag, and MPLS-TP OAM support; RS-FEC support for SR4 and SR10 transceivers; Q in Q (VLAN stacking), MPLS, MPLS-TP, PBB, EoE support; MAC flooding; RFC2544 and V-SAM (Y.1564) testing; IPv4 and IPv6 traffic generation; BERT and throughput testing at Layer 2 and Layer 3; smart Loopback mode for Layer 2 and Layer 3; one-way-delay latency measurement (GPS assisted); line rate packet capture with Wireshark decode; and error and alarm injection.

TelecomTest Solutions
www.telecomtest.com.au



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SMART METERS, ASBESTOS AND ELECTRICAL SAFETY

The Queensland Electrical Safety Office (ESO) is reminding electrical contractors of the safe work standards they're expected and obliged to maintain during the installation of smart meters.

Persons conducting a business or undertaking (PCBUs) must ensure the work carried out must be electrically safe and must not compromise the safety of people or property. For smart meter installations, the following points must be kept in mind:

Work de-energised

• PCBUs must have systems in place to ensure the equipment is not energised during meter replacement or installation, including isolation and lockout.

• PCBUs must ensure the equipment is tested to determine whether or not it is energised before electrical work is carried out.

• *Test for dead before you touch* must be applied at all times.

Testing

• Workers must test appropriately when installing the meter and should record the tests.

• Testing equipment must be suitable for testing and fault finding.

• Testing equipment must itself be properly tested and in good working order.

Licensing and training

• Workers must have an electrical mechanics licence.

• Workers must be appropriately trained and competent in meter replacement work.

This list is by no means exhaustive. PCBUs must ensure all risks are managed for their electrical workers replacing or installing smart meters. If in doubt, the *Electrical Safety Act 2002 s.30 and 39* list the duties of care for both a person conducting a business or undertaking (PCBU) and a worker. In addition, the *Electrical Safety Code of Practice 2013 - Managing electrical risks in the workplace* is a practical guide to achieving the electrical safety standards required.

Separately, concerns about asbestos in meter boxes, in particular the meter backing board/switch board, have also been flagged and PCBUs should ensure all electrical workers replacing or installing smart meters are aware of how to identify and work safely with these materials, according to Queensland ESO.

It can be difficult to identify asbestos materials by sight, but there are some common uses of asbestos in electrical equipment which are easy to spot. The only way to be certain is to have a sample of the material analysed by a laboratory. However, if the building was built before 1990 and has never had its switchboard replaced, it's very likely the backboard will contain asbestos.

Property owners should be asked about the age of the building when the job is booked, but if workers have any doubt on the day, they must assume the backboard contains asbestos and take adequate precautions before work starts:

- Explain to the property owner and anyone there on the day why asbestos risk control measures will be used.
- Use barricades and signs to identify and restrict access to the work area.
- Wear a half face P2 respirator (worker must be clean shaven) and disposable gloves.
- Put plastic drops sheets under the meter box.
- Once de-energised and tested, vacuum (using an H-class industrial vacuum, not a household vacuum) or use a wet wipe/s inside the switchbox, panel and electrical equipment to remove dust and debris before and after the work is done.
- Use a vacuum drill attachment when drilling into the switchboard.
- If a vacuum attachment can't be used, apply petroleum jelly (or similar thickened substance) and tape on both sides of drill hole.
- Use a low-speed battery drill.
- Use wet wipe/s or an H-class industrial vacuum to remove any dust and debris from the drilling.
- The vacuum, hose and attachments must be cleaned using wet wipes.
- Wipe all tools with wet wipes.
- Double-bag all asbestos waste, including disposable PPE, wet wipes, gloves, disposable respirator and plastic sheeting and seal with tape.
- Do not remove respirators until all waste is bagged and sealed and clean-up is complete.
- Ensure all bagged asbestos waste is secured on work vehicles where it will not be damaged or punctured or fall from the vehicle.
- Dispose of bagged waste as soon as possible in an asbestos waste bin or at an authorised asbestos disposal location.

This advice is for guidance only. For a comprehensive recommended safe work procedure, please refer to the 'How to manage and control asbestos in the workplace code of practice: Appendix F'.

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Residual current circuit breakers

The ABB DS203NC RCBO (residual current circuit breakers with overcurrent protection) is totally integrated into the modular System pro M compact range and is a suitable response to the request for protective equipment that meets the different types of circuits of the modern three-phase systems.

It is a compact and sensitive solution for a 3P+N RCBO device, offering 30% less space requirement for installations.

DS203NC range combines, in a single device of only four modules width, the protection against overcurrents (overload and short circuit) and earth fault currents. The range, developed in accordance to product standards IEC/EN 61009-1 and IEC/EN 61009-2-1, is available with a breaking capacity of 6 kA.

ABB Australia Pty Ltd
www.abbaustralia.com.au

String monitoring device

The Transclinic 16i+ 1k5 string monitoring device monitors voltage and current within a photovoltaic system with the DC string up to 1500 V.

The solution offers the possibility of monitoring individual photovoltaic strings in order to detect faults or loss of performance on the DC side in a timely way. This allows the performance of the entire photovoltaic system to be increased and economy to be enhanced. It can be used in an extremely wide range of environments and over large temperature ranges, while simultaneously resolving the space-related problems of the past. The system's 16 connections halves the amount of required space.

The system is said to function reliably over a temperature range of between -25 and +70°C, and at heights of up to 3000 m, making the system suitable even when faced with strict requirements.

An integrated switch provides protection against cases of damage resulting from the incorrect cabling of the communication interface.

Weidmuller Pty Ltd
www.weidmuller.com.au

Single-phase current monitoring relay

The Relpol MR-EI1W1P single-phase current monitoring relay, available from Control Logic, is suitable for monitoring the load of motors and other critical equipment.

It allows users to detect signs of wear and faults early by eliminating the threat of system failures before they happen. The relay features adjustable thresholds and hysteresis, including timing adjustment of tripping delay, one changeover contact output and a wide operating temperature range of -25 to 55°C.

Featuring a modular design, the relay is 17.5 mm wide and can be direct mounted on a 35 mm rail for quick and easy installation.

Control Logic Pty Ltd
www.control-logic.com.au

COMPACT I.T. GIVES REMOTE COMMUNITIES ROUND-THE-CLOCK CONFIDENCE

A leading not-for-profit organisation in New Zealand provides emergency relief and support to the Pacific Islands through first aid, communication and disaster preparedness training. When disaster strikes, its emergency response unit can be deployed to provide IT and communications support services on the ground. However, these technical experts are also working to build technology capability and train their Pacific Island neighbours on how to use technology and conduct basic maintenance and repairs.

Working in partnership with ServerWorks, a Christchurch-based IT services company, the not-for-profit organisation was able to design a compact IT solution to give remote communities round-the-clock confidence.

Keeping equipment alive in harsh environments

The predominant challenge facing the not-for-profit organisation and its network of Pacific Islands was the ability to maintain technology infrastructure. IT and communications were often one of the last considerations in planning despite the growing need for technical resources that ensure the day-to-day running of the organisation and telecommunications during business as usual and in times of a disaster.

With few IT personnel on the Pacific Islands, technology systems were often rundown and with many locations susceptible to sea air and sandy dust, technical equipment would degrade at a quicker rate.

This resulted in a higher risk of technology issues occurring in a disaster, causing slow communication and delayed ground assessments.

A complete, compact and durable solution

ServerWorks designed a telecommunications system called Zero Local Touch (ZLT) — a compact IT solution that holds everything from power redundancy and networking, to cybersecurity and much more. The system can be easily deployed across the not-for-profit organisation's Pacific Island network, allowing devices to stay connected wirelessly or via cable and keep communications alive during disaster recovery. To ensure design and operational longevity of the system, it was critical for ServerWorks to select the right technology to keep ZLT functioning during times of emergency, and protect it against the elements, from cyclones to extreme heat.

Eaton answered the call, supporting ServerWorks to build the Zero Local Touch system 'in a box'. It was designed and built using the Eaton SC200 monitor, Eaton cabinet fan controller, Eaton 9PX EM 2kVA UPS with 9PX BM, Eaton MBS, Eaton iPDU, Eaton surge filter, Eaton iPM software, plus aerials, modems, Fortinet and HPE networking and server equipment.

ServerWorks needed an enclosure to protect the technology against harsh environments. After evaluating a range of different products in the market, Eaton's ExoCab18 outdoor enclosure was the only product that ticked all the boxes and was readily available.

Kraig Winters, General Manager/owner at ServerWorks, said there were a lot of cabinet vendors offering to design something from scratch but none were able to meet the brief.

"We needed an enclosure that required very few engineering modifications, such as extending the depth of the cabinet, and could withstand challenging environmental conditions. Immediately we saw the value in the additional longevity we would gain from Eaton's product, which is fully covered by IP rated heat exchange," said Winters.

"With Eaton backing up the ZLT, we can expect a long lifecycle. The cabinet is built to last and will service the Pacific Islands for at least the next 10 to 20 years."

Eaton went beyond the supply of products and was available to ServerWorks every step of the design and build process — from customer support enquiries to UPS soft shutdown procedure training.

Looking to the future

After rigorous testing at ServerWorks' workshop, the ZLT solution was deployed in March to the Tonga Islands. The team will be looking at how the system can transform the way disaster recovery services are coordinated in their day-to-day operations and in times of a disaster.

"Once implemented, the solution has the scalability to meet IT demands of up to 70 staff and leveraged through a fixed line, mobile or satellite commutations to stay online at a fixed location," said Winters.

"When a disaster occurs, the building may not be habitable and the ZLT can be relocated and operate for up to four hours on back-up power, to ensure the team can access data about ground zero instantly — streamlining aid deliveries from days to potentially hours.

"It is this capability that makes it possible for this solution to be rolled out and deployed across many other organisations and locations in the Pacific Islands who face identical challenges and give local teams the tools to become more resilient and self-sufficient.

"As we explore new opportunities, we look forward to working with Eaton to leverage new advances in UPS technologies and enclosures."

Eaton Industries Pty Ltd
www.eatonelectric.com.au

Single point suspension cable

Prysmian's Single Point Suspension (SPS) cable system is a unique solution designed for bore-hole installations. The solution is available in 11–22 kV ranges and is a convenient and economical alternative to traditional catenary systems.

The SPS system comprises a double wire armoured cable and self-supporting clamp. The complete system is designed to ensure that built-in components will be able to withstand the mechanical strain when suspended vertically.

While it is a solution mainly suited to bore-hole installations in underground (UG) mines, the SPS system has found acceptance with applications involving installation on steep slopes.

Having recently upgraded their facilities to enable the local manufacture of the SPS cable, lead times have been significantly reduced. The final design of this cable system is installation specific, so Prysmian can tailor make it to suit user requirements.

Prysmian Australia PTY LTD
www.prysmiancable.com.au

Fibre optic splicers

The Fujikura 70S+, 70R+ and 62S+ Fibre Optic Splicers offer Bluetooth capability to wirelessly communicate parameter settings with a smart device. They are used for splicing fibre optic cables, both single and 12 fibre ribbon.

The 70S+ offers high speed — with a 6 s splice time and 9 s heat/shrink time. It also offers programmable features, such as an automated wind protector and independently programmable sheath clamps that reduce splice time and increase productivity. It offers a long life battery providing 200 splice/heat cycles and long-life electrodes that provide up to 5000 splices.

An economical alternative to the fully automated 70S+, the 62s+ uses a conventional wind protector and tube heater design. With a 23 s shrink time, the 62S+ offers a high level of productivity.

The 70R+ is a fast and rugged ribbon fusion splicer. Splice/heat cycle time has been reduced to just 18 s (using FP-04(T) splice protectors), with battery life of 110 splice/heat cycles and extended electrode performance of 1500 splices per set.

These latest models include all the features of previous models — fuse connect compatibility, a large monitor, built-in instructional videos and a fully ruggedised design that is shock, dust and rain proof.

AFL Telecommunications Pty Ltd
www.aflglobal.com/au

RCDs

The ABB F200 B Residual Current Devices (RCDs), available from Control Logic, assist in detecting different waveforms of residual fault currents and operate when the electrical system has a high leakage current to ground.

The compact devices feature a bidirectional cylindrical clamp designed to facilitate safe execution of the electrical connections due to the presence of two distinct seats for cable entry. The clamp structure eliminates any chance of incorrect cable fastening operations and detects hazardous situations for people and the system. The front of the circuit breakers features a test button to check the proper operation of the devices and an LED indicator to signal the kind of leakage that the RCD is detecting.

Type B RCDs are considered universal devices, as they provide protection against all the tripping waveforms listed in the Standards EN 62423 and can be integrated with all devices produced by ABB in terms of connection, selectivity data and coordination. In addition, they ensure high protection levels, with maximum operational continuity under all working conditions, and are certified for operation in harsh weather conditions up to 60°C.

Control Logic Pty Ltd
www.control-logic.com.au

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Cables

The Lapp ETHERLINE PN CAT.6a Fast Connect high-speed cable is suitable for customers in the machinery, plant and equipment manufacturing sector and can be used in industrial and building networking wherever large data volumes have to be transmitted.

At 10 gigabits per second, the cable achieves the current maximum transmission rate for copper cables in an industrial environment. Thanks to a cross separator that separates the four pairs of wires and an inner sheath, the cable does not need pair screening. There is no need to remove a film screen from all four pairs of wires. As a result, Fast Connect cables are quick and easy to assemble. The new shielding helps ensure a long service life.

The ETHERLINE PN CAT.6a is available in seven versions: three for fixed installation (Type A) with flame-retardant PVC sheath, halogen-free and flame retardant with FRNC sheath or with PUR sheath (halogen-free, flame retardant and with increased mechanical strength). In addition, Lapp supplies two versions for flexible use (Type B) with PVC sheath or halogen-free and flame-retardant FRNC sheath, as well as two solutions for highly flexible use (Type C) with PVC sheath or PUR sheath. Four further versions have reduced dimensions for use in constricted applications. The different sheath designs and diameters allow the cables to be used in a range of applications.

LAPP Australia Pty Ltd
lappexpress.com.au

Industrial cabinet

The MFB S280 industrial cabinet has been enhanced with the option of lining the enclosure with Thermobreak insulation foam to reduce the amount of heat entering into the cabinet.

For additional protection, MFB has introduced double skin on all doors and sides with a side-mounted, filterless, maintenance-free air conditioner. Available in various sizes from 12 to 45RU, with free standing or wall mounting options on depending on the user's requirements, the cabinet is suitable for remote outdoor application.

Whilst mild steel is the standard option, the cabinet comes in different grades of stainless steel depending on the environment. The cabinets are of continuous welded construction, fabricated from steel, making them robust. MFB can achieve up to IP66 dust and moisture specifications subject to user requirements.

MFB Products Pty Ltd
www.mfb.com.au

Mini magnetic contact

The AMC CM900MINI Mini Magnetic Contact, distributed by LSC Security Supplies, stands at only 50 mm high.

The small device features two completely separable and partitionable configurable inputs: an internal reed and a clamped input (for an external generic contact). It communicates with the control panel (such as the XR900) via a 916 MHz bidirectional digital radio transmission channel, to both avoid signal collisions and/or band saturation and to ensure high stability and precision.

Other features include: 128-bit AES encryption for guaranteed high security; anti-opening protection; supervised (automatic life test); long battery life (with use of standard lithium-ion batteries).

Like all AMC products, the CM900MINI is designed and manufactured in Italy. And for end-user ease, the contact can be managed using the AMC Manager App, available for both iOS and Android devices.

LSC
www.lscsecuritysupplies.com.au

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LIGHTING
THE WAY FOR CHANGE

Lighting Council CEO Richard Mulcahy reflects on recent developments in the industry.

The lighting industry provides over 4500 manufacturing jobs in a sector that produces over two billion dollars' worth of manufacturing output.

In the aftermath of the COAG Energy Ministers' Council Meeting in April this year, much attention was given to the progress of negotiations around the NEG, or National Energy Guarantee. In that same meeting, however, the Ministers also gave their endorsement for significant changes that will affect the lighting products available to Australian consumers. These changes include an undertaking from the Commonwealth Government to follow the product regulation approach to be adopted in the European Union for LED lamps — an important priority for the lighting industry as a unique Australian approach would have created significant costs for industry and consumers. The other key change was a commitment by the federal government to phase out halogen lamps by 2020. The phase-out is expected to save $1.5 billion in electricity costs, with the vast majority of that amount to be realised in savings by Australian households.

Halogen phase-out

While the expected savings from the phase-out of halogens — some $650 per household over 10 years — is not as high as those expected to arise from a fully implemented NEG, the savings are substantial and based on robust modelling that is not subject to the political vagaries of federal-state negotiations. Households looking to save on their electricity bills can find significant savings commencing from the time of installation. For those households that have a large number of inefficient halogen lamps — and there are an estimated 50,000,000 halogen downlights in Australia — the savings from installing efficient LED lights could amount to hundreds of dollars per year.

Minister Frydenberg, the Commonwealth Minister for the Environment and Energy, has taken a sensible step in accelerating the phase-out of halogen lamps. By limiting the number of less-efficient products available, government will help reduce the pressure on household budgets by ensuring that consumers are adopting high efficiency products sooner.

The lighting industry is pleased to play a significant role in reducing energy consumption and Lighting Council Australia will work with government for the phase-out to be well understood by the public.

Emergency lighting regulations

In May 2014, the Australian Building Codes Board (ABCB) made changes to the National Construction Code (NCC) about emergency lighting. The NCC is the instrument through which government regulates the energy performance standards of new buildings, and emergency lights are the means by which occupants of a building can identify exit points during emergency situations. The effect of the 2014 change, however, was to allow those emergency lights to be made of photoluminescent (glow-in-the-dark) material.

In a move that was roundly criticised by experts including engineering peak bodies, fire safety experts, firefighter associations and electrical contractor associations, these glow-in-the-dark signs can legally comply with the requirements of the regulations by providing 1/250th of the level of brightness that the traditional battery-powered units are mandated to provide. The brightness level of the conventional battery-powered sign is based on over four decades of research, which in turn underpins the regulatory approach adopted by advanced economies around the world.

The Grenfell disaster and similar near-misses in Dubai and Melbourne in recent years tie into serious concerns about the use of combustible materials in the building and construction sector. Our view as the peak body for the lighting industry is that government is taking on an unacceptable and unjustified level of risk by allowing these glow-in-the-dark signs to be used. Millions of Australians find themselves in buildings each day where, if there was an emergency with poor visibility or that caused panic, they would be entirely reliant on a well-illuminated guidance system pointing them to the nearest evacuation point.

Draft 2019 National Construction Code

The lighting industry is alarmed about aspects of the next draft of the National Construction Code, scheduled for commencement in 2019. Central to the concern of industry is an inappropriate focus given by policymakers on the issue of energy efficiency at the cost of the range of products that can be used and, as a consequence, on the wellbeing of occupants. There is a well-established and growing body of literature demonstrating a strong connection between lighting and the productivity, alertness and utility of occupants in the built environment. This field of research — human-centric lighting — has led to considerable advances in the range of products that are used, particularly within the office environment, with tangible benefits for both business owners and those exposed to the lighting systems. The current draft of the NCC emphasises energy efficiency, which is an important

aspect of evaluating a lighting installation but is by no means the only or most important aspect of the lighting approach to be used within a building. High-quality lighting systems can be both energy efficient and yield the benefits presented by human-centric lighting systems. Lighting Council Australia will work to ensure that building designers and owners are not needlessly denied the ability to use fit-for-purpose, high-quality installations in the pursuit of a bottom-line energy efficiency figure.

The lighting industry remains a highly dynamic market with a fast rate of product development. LED technology has revolutionised the industry, most significantly in the last five years. Few industries have seen product performance improve multiple times over with respect to product life, energy consumption and reliability. The industry members are finding their products increasingly integrated into broader systems, including commercial building automation systems, smart home systems or smart city networks. Given lighting's central role to the built environment, we are excited about the coming years in our sector.

Field service solution

The IFS Field Service Management 6, built for the cloud but also available on-premise, offers a reimagined user experience and a 50% performance improvement.

With a completely reengineered, fully responsive front end, the software will run on any browser and on any device at any time. The new UX features user-centric and intuitive action patterns as well as stunning graphic designs including high-resolution charts and diagrams.

The PSO component of the software yields a 50% improvement in processing performance on Microsoft Azure. In addition, the maximum number of activities per standard Dynamic Scheduling Engine (DSE) for dynamic responsive processing has been significantly increased.

Other features include: written in an all-new scripting language that allows customers to configure data fields, workflows and user behaviour, the solution eliminates the need for costly customisations, providing greater agility while evergreen service management capabilities ensure seamless updates; the solution introduces a multitude of significant new features and extensions to existing functionality in areas including increased scheduling optimisation flexibility, warranty claims management, mobile synchronisation and UI improvement; customers can choose to deploy IFS FSM 6 as a true multitenant solution on the Microsoft Azure cloud, as a managed service in the cloud or on-premise. This flexibility also offers customers choice in how they pay, from outright ownership to a monthly subscription.

IFS Australia

www.ifsworld.com/au

Cable analyser

The DSX-5000 copper test solution enables testing and certification of twisted pair cabling for up to 10 Gb Ethernet deployments, and will certify shielded and unshielded structured cabling systems from Category 3, to 7A and Class C, to FA at Level V accuracy. It is available to rent from TechRentals.

In addition to a Taptive user interface, this instrument features high-speed testing which includes 9 s Category 6 auto test and built-in alien crosstalk testing capability. PLA004 (Cat 6A/Class EA) and CHA004 (Cat 6A/Class EA) adapters are included.

The DSX-5000 will identify potential errors from improperly installed cabling, which can result in downtime, bottlenecks and lost productivity. Its high-speed cable certification and accuracy enables technicians to do more in only a fraction of the time.

TechRentals

www.techrentals.com.au

Mobile test case

The Phoenix Contact Checkmaster 2 mobile test case lets technicians quickly and accurately test all Phoenix Contact pluggable surge protection devices.

With Checkmaster 2, technicians can check the electrical status of their surge protection devices to prevent unexpected failures, and avoid unnecessary service calls.

The case features a convenient, integrated hand scanner that reads and identifies the surge protection device by its barcode. The test object is then simply inserted into the associated test adaptor and the test process started via the touch-panel screen. The surge protection device is electrically tested in an automatic test process that compares the current electrical parameters of the components with the specified reference values.

To ensure a highly accurate result, all of the installed protective elements of the surge protection device are electrically tested in a single cycle. These include triggered spark gaps, gas-filled surge protectors, varistors and suppressor diodes.

The results are easy to see and read on a colour display, and three status levels inform the technician of the current quality of the device. The three status levels are 'OK: Test passed', 'Warning: Tolerance limit reached' and 'Defect: Replacement required'. These help the technician make informed decisions about the device to ensure the ongoing availability of systems.

The tests conform to requirements in IEC 62305-3 and are performed using a high-voltage generator. The tester documents and saves all test results to its internal memory. A USB port lets technicians transfer data for further processing as well as update software.

Phoenix Contact Pty Ltd

www.phoenixcontact.com.au

You live in a city but can it be more efficient, safer, healthier... smarter?

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EtherCAT terminals

The Beckhoff ELX series EtherCAT Terminals has been expanded by the addition of analog input terminals with TwinSAFE SC (single-channel) technology.

These compact I/O terminals can be used to support applications in hazardous areas that require both intrinsically safe signal transmission and functional safety capabilities.

The terminals, which are certified in compliance with the specifications of the ATEX and IECEx standards, enable direct connection of intrinsically safe field devices through to Zone 0/20 based on an integrated safety barrier.

The new terminal designs extended by TwinSAFE SC technology also make it possible to achieve a safety level equivalent to PL d/Cat. 3 according to EN ISO 13849-1 or SIL 2 according to EN 62061. In this way, it is possible to use all process data existing in a system for safety technology too, such as to monitor the speed of fans in areas sensitive to explosion hazards, for example.

The I/Os are available as 12 mm wide terminals with two or four analog input channels for 0/4…20 mA, and for RTD resistance sensors, thermocouples/mV and strain gauges. Furthermore, a single-channel terminal is available for the direct connection of intrinsically safe incremental encoders, which evaluates a diagnostic-enabled NAMUR signal in accordance with IEC 60947-5-6.

Beckhoff Automation Pty Ltd
www.beckhoff.com

Digital ultrasonic leak detector

The Ultraprobe 3000 from UE Systems is a digital ultrasonic inspection, information, storage and retrieval system. The handheld instrument is designed for leak detection and steam trap inspection of compressed air, electrical, fluid and mechanical systems. It is available to rent from TechRentals.

The product features a fixed frequency response as well as spin and click technology, allowing the user to adjust sensitivity as well as store and record data with just one control. Through this streamlined process, the device simplifies convoluted inspection processes.

Recorded data can be stored and downloaded via USB interface for further analysis. A tone generator, stethoscope probe and rubber focusing probe are supplied in addition to the UP3000 unit.

The product is suitable for identifying and eliminating energy waste in common industrial set-ups such as compressed air systems. It helps to ensure systems function efficiently while simultaneously reducing environmental impact.

TechRentals
www.techrentals.com.au

LED bulbs inspired by sunflowers

The Signify Philips MyCare LED bulb features Interlaced Optics technology to enhance eye comfort. Its design is inspired by the pattern of sunflower seeds.

The Interlaced Optics in the LED lamps diffuse and reflect light. This is said to reduce glare — the excessive brightness caused by an intense light beaming from the centre of the bulb — by up to 35%, resulting in a uniform light that is comfortable on the eye. The micro Interlaced Optics are imprinted onto lamps, increasing the light beam angle, so wider areas of the home can be lit more uniformly.

The Philips MyCare LED bulb with Interlaced Optics launched in China, Hong Kong, Malaysia, Korea and Singapore from June 2018 with rollout planned globally from 2019. They will be available in an E27 fitting, at 3000 and 6500 K colour temperatures.

Signify
www.signify.com

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Stuck without the quality inspection equipment your optical network needs? AFL's FlexScan™ OTDR offers all the essentials to troubleshoot and verify your FTTH PON or point-to-point optical network. With FlexScan, network verification and troubleshooting have never been so easy, so complete, and so cost-effective.

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www.AFLglobal.com

FAULTS AND POWER GRIDS

Kirsten Flint

A West Australian researcher has developed software that could help us avoid another Black Saturday catastrophe.

Just before midday on Saturday, 7 February 2009 in rural Victoria, a power line failed.

What followed was the most devastating bushfires Australia has ever seen. 173 people were killed in the Black Saturday bushfires. Hundreds more were injured, and billions of dollars' worth of property was destroyed.

The reality is, catastrophes of this nature aren't that far away.

Globally, most of the energy infrastructure that we rely on every day is over 35 years old. Like most things, age has not improved its functionality. Of course, there are some protective measures in place to prevent widespread damage.

"But unfortunately," says Dr Ahmed Abu-Siada of Curtin University, "sometimes these fail."

Another massive bushfire burned through Tathra in NSW early in 2018, again the result of a faulty power line. It was a miracle that no one died.

There are people who work to prevent these sorts of catastrophes. Maintenance crews fly helicopters alongside high voltage power lines, getting up close to visually inspect infrastructure bit by bit.

A much safer approach to maintenance is to take assets offline and then assess them for faults. The inconvenience of a power outage is a small price to pay for non-faulty power lines, right?

But now an innovation from Ahmed has the potential to do away with these inconvenient, time-consuming and dangerous practices — and also save us a whole lot of money.

Valuable, innovative, online

ViON is real-time monitoring software that can alert us to the early warning signs of power failure — from the safety and comfort of a desk chair.

Electrical network assets such as transformers (used in the transmission of energy from power stations to consumers) have unique energy fingerprints. These are elliptical patterns—a visual representation of the energy going in and out of the transformer.

Minor changes in the shape of this ellipse are early warnings that something is not quite right.

ViON's algorithm will detect any changes to these fingerprints, signalling that there may be an imminent failure of a power line. We are then able to step in, isolate the faulty asset and fix it up before we suffer a blackout or worse.

Along with saving lives, this software could save us money. The current cost of monitoring and maintenance is exorbitant, let alone the money required to replace assets when they are in fact broken.

Future power

ViON works, and we know it could be useful — it's even been written about in peer-reviewed journals.

The input data necessary for the software is easily accessible. It already exists in the network, it's simply not being used. Additionally, no extra hardware needs to be installed. Theoretically, ViON could be up and running today.

But we'll only begin to benefit from ViON once people start to use it out in the real world, and for this, Curtin University is looking for commercial partners.

"The next necessary step is to test it in the field to help refine the software and make it increasingly accurate."

Ahmed suggests that, in the future, there may be applications for ViON in residential living. It may allow us to detect inefficiencies and reduce how much we spend on electricity, as well as potentially reducing insurance premiums. If we're all at lower risk of bushfires, perhaps we'll be charged less to insure our homes and belongings.

If you're thinking that sounds incredibly useful and wondering why anything like this hasn't been developed before, you're not alone. I asked Ahmed the very same question, but curiously, there doesn't seem to be any real reason why.

All we can hope is that field trials forge ahead and produce the convincing results necessary for ViON to be adopted near and far. Because if it could help avoid another Black Saturday, surely it's worth investing in.

This article was originally published on Particle.

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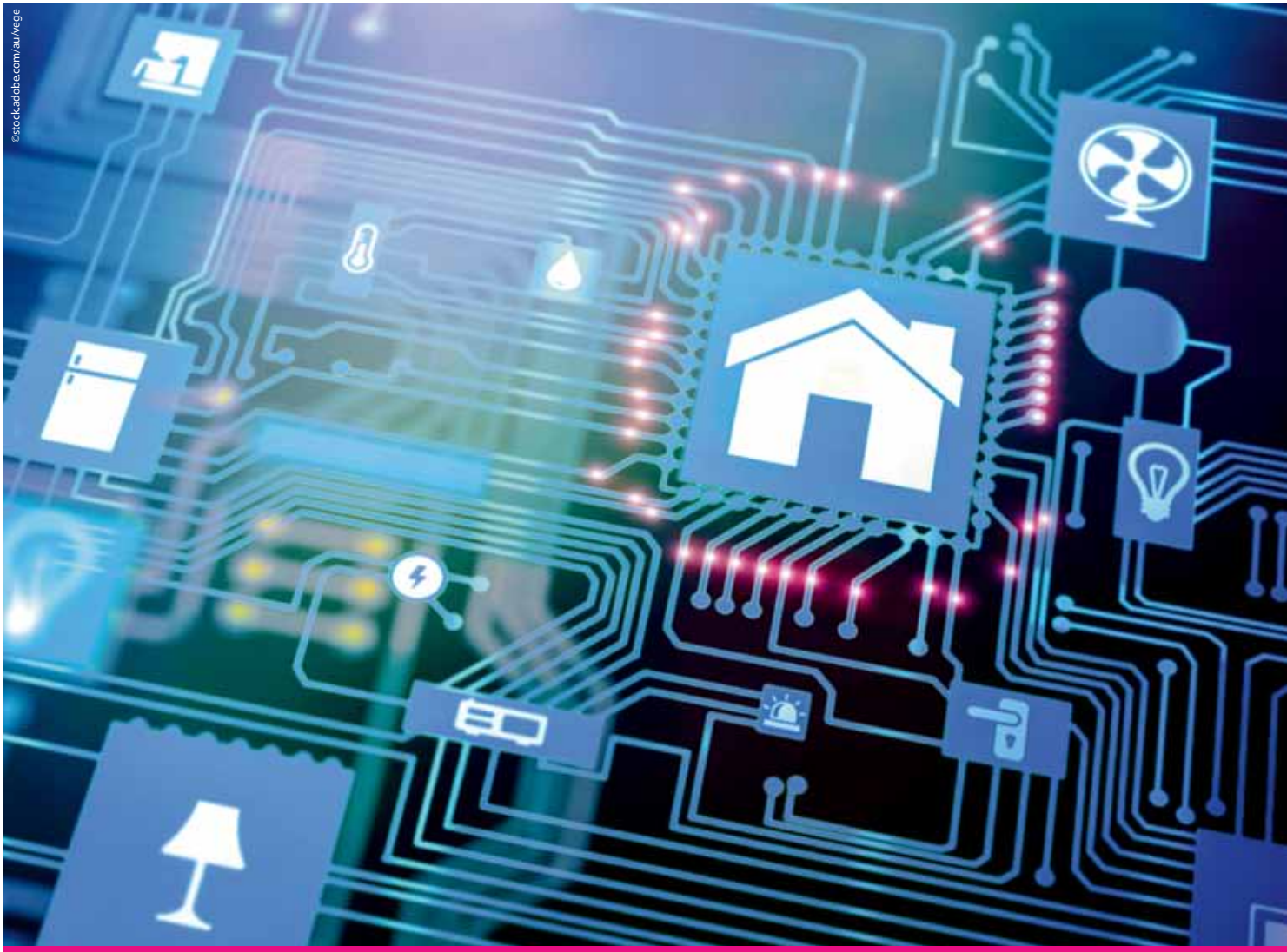


INTERNET-ENABLED ARC FAULT DETECTION

Jennifer Chu, MIT News Office

The problem with today's arc-fault detectors, according to a team of MIT engineers, is that they often err on the side of being overly sensitive, shutting off an outlet's power in response to electrical signals that are actually harmless.

Now, the MIT team has developed a solution that they are calling a 'smart power outlet', in the form of a device that can analyse electrical current usage from a single or multiple outlets and can distinguish between benign arcs — harmless electrical spikes such as those caused by common household appliances — and dangerous arcs, such as sparking that results from faulty wiring and could lead to a fire. The device can also be trained to identify what might be plugged into a particular outlet, such as a fan versus a desktop computer.

The team's design comprises custom hardware that processes electrical current data in real time and software that analyses the data via a neural network — a set of machine learning algorithms that are inspired by the workings of the human brain.

In this case, the team's machine-learning algorithm is programmed to determine whether a signal is harmful or not by comparing a captured signal to others that the researchers previously used to train the system. The more data the network is exposed to, the more accurately it can learn characteristic 'fingerprints' used to differentiate good from bad, or even to distinguish one appliance from another.

Joshua Siegel, a research scientist in MIT's Department of Mechanical Engineering, said the smart power outlet is able to connect to other devices wirelessly, as part of the Internet of Things (IoT). He ultimately envisions a pervasive network in which customers can install not only a smart power outlet in their homes, but also an app on their phone, through which they can analyse and share data on their electrical usage. These data, such as what appliances are

Image credit: Christine Daniloff, MIT.

> THE SMART POWER OUTLET DESIGN WILL ONLY GET MORE INTELLIGENT WITH INCREASING DATA.

plugged in where, and when an outlet has actually tripped and why, would be securely and anonymously shared with the team to further refine their machine-learning algorithm, making it easier to identify a machine and to distinguish a dangerous event from a benign one.

"By making IoT capable of learning, you're able to constantly update the system, so that your vacuum cleaner may trigger the circuit breaker once or twice the first week, but it'll get smarter over time," said Siegels. "By the time that you have 1000 or 10,000 users contributing to the model, very few people will experience these nuisance trips because there's so much data aggregated from so many different houses."

Siegel and his colleagues have published their results in the journal *Engineering Applications of Artificial Intelligence*. Co-authors are Shane Pratt, Yongbin Sun and Sanjay Sarma, the Fred Fort Flowers and Daniel Fort Flowers Professor of Mechanical Engineering and Vice President of open learning at MIT.

Electrical fingerprints

To reduce the risk of fire, modern homes may make use of an arc fault circuit interrupter (AFCI), a device that interrupts faulty circuits when it senses certain potentially dangerous electrical patterns.

"All the AFCI models we took apart had little microprocessors in them, and they were running a regular algorithm that looked for fairly primitive, simple signatures of an arc," Pratt said.

Pratt and Siegel set out to design a more discerning detector that can discriminate between a multitude of signals to tell a benign electrical pattern from a potentially harmful one.

Their hardware set-up consists of a Raspberry Pi Model 3 microcomputer, a low-cost, power-efficient processor which records incoming electrical current data, and an inductive current clamp that fixes around an outlet's wire without actually touching it, which senses the passing current as a changing magnetic field.

Between the current clamp and the microcomputer, the team connected a USB sound card, commodity hardware similar to what is found in conventional computers, which they used to read the incoming current data. The team found such sound cards are ideally suited to capturing the type of data that is produced by electronic circuits, as they are designed to pick up very small signals at high data rates, similar to what would be given off by an electrical wire.

The sound card also came with other advantages, including a built-in analog-to-digital converter that samples signals at 48 kilohertz, meaning that it takes measurements 48,000 times a second, and an integrated memory buffer, enabling the team's device to monitor electrical activity continuously, in real time.

In addition to recording incoming data, much of the microcomputer's processing power is devoted to running a neural network. For their study, they trained the network to establish 'definitions', or recognise associated electrical patterns, produced by four device configurations: a fan, an iMac computer, a stovetop burner and an ozone generator — a type of air purifier that produces ozone by electrically charging oxygen in the air, which can produce a reaction similar to a dangerous arc-fault.

The team ran each device numerous times over a range of conditions, gathering data which they fed into the neural network.

"We create fingerprints of current data, and we're labelling them as good or bad, or what individual device they are," Siegel said. "There are the good fingerprints, and then the fingerprints of the things that burn your house down. Our job in the near term is to figure out what's going to burn down your house and what won't, and in the long term, figure out exactly what's plugged in where."

Shifting intelligence

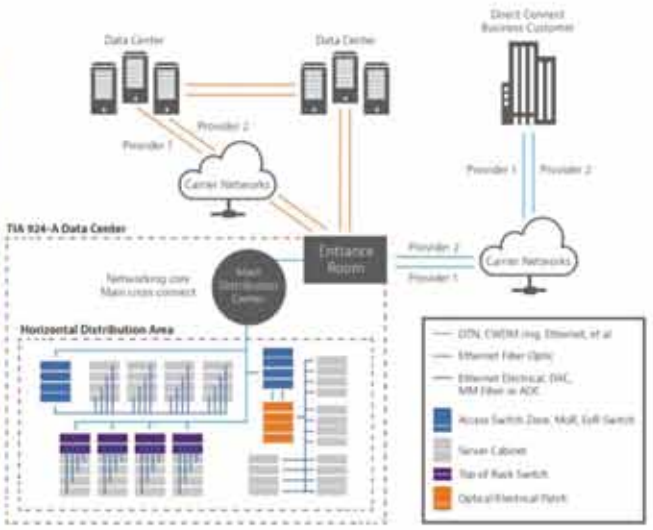
After training the network, they ran their whole set-up — hardware and software — on new data from the same four devices, and found it was able to discern between the four types of devices (for example, a fan versus a computer) with 95.61% accuracy. In identifying good from bad signals, the system achieved 99.95% accuracy — slightly higher than existing AFCIs. The system was also able to react quickly and trip a circuit in under 250 milliseconds, matching the performance of contemporary, certified arc detectors.

The smart power outlet design will only get more intelligent with increasing data, said Siegel. He envisions running a neural network over the internet, where other users can connect to it and report on their electrical usage, providing additional data to the network that helps it to learn new definitions and associate new electrical patterns with new appliances and devices. These new definitions would then get shared wirelessly to users' outlets, improving their performance and reducing the risk of nuisance trips without compromising safety.

"The challenge is, if we're trying to detect a million different devices that get plugged in, you have to incentivise people to share that information with you," Siegel said. "But there are enough people like us who will see this device and install it in their house and will want to train it."

The team's results, according to Siegel, provide a proof of concept for 'pervasive intelligence' and a world made up of everyday devices and appliances that are intelligent, self-diagnostic and responsive to people's needs.

"This is all shifting intelligence to the edge, as opposed to on a server or a data centre or a desktop computer," Siegel said. "I think the larger goal is to have everything connected, all of the time, for a smarter, more interconnected world. That's the vision I want to see."



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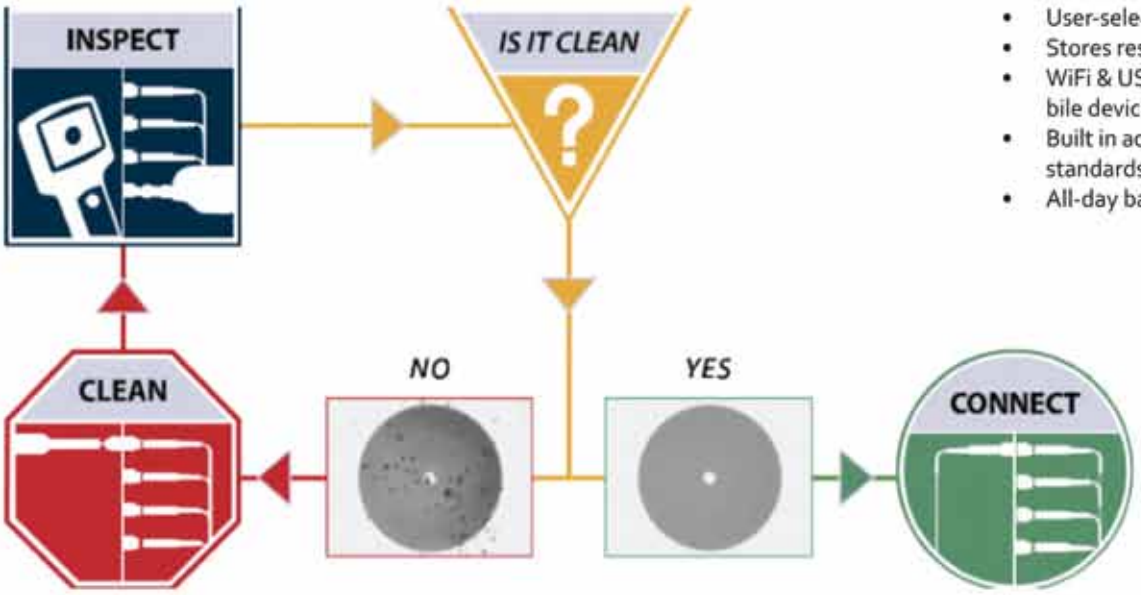

Compact field testers

Anritsu enhances its Network Master Pro MT1000A to support 100 Gbps with Ethernet Common Public Radio Interface (eCPRI) and IEEE 1914.3 Radio over Ethernet (RoE), as well as high-accuracy delay measurement functions. With the new firmware installed, the MT1000A can be used by mobile operators, communication network installation companies and communications equipment vendors to efficiently and effectively install and maintain 5G networks carrying eCPRI/RoE traffic.

A small handheld tester, the MT1000A is a comprehensive solution that supports all-in-one network evaluations, including eCPRI/RoE/CPRI, Ethernet, OTN, Fibre Channel, SDH/SONET and PDH/DSn. As a result, one MT1000A can perform bit error rate (BER), throughput and latency tests on mixed communications networks based on current optical and digital communications standards.

To ensure network high speed and reliability, the MT1000A can also be integrated with the High Performance GPS Disciplined Oscillator MU100090A receiver option with built-in accurate rubidium reference clock. In this configuration, the Network Master Pro supports evaluation of the time synchronisation accuracy for time error measurements. Integrating the MU100090A option, which provides GPS time data, allows the MT1000A to support complementary high-accuracy latency measurements, as well.

The MT1000A supports automated testing and Pass/Fail evaluations, eliminating the need for an external controller such as a PC. Operators at any experience level can run network tests, perform Pass/Fail evaluations and create test reports efficiently and easily with the Network Master Pro.

With the new firmware update supporting eCPRI/RoE traffic and high-accuracy latency measurements, the Network Master Pro MT1000A is an effective solution for current and future network verification requirements. The compact solution is designed to provide reliable and stable tests on 10 G, 25 G and 100 G metro, access and mobile networks. In addition to supporting RFC2544, Y.1564 and many other network evaluation test standards, it supports Sync-E and IEEE 1588v2 tests. Its flexible configuration that allows test items to be added as custom options helps optimise equipment capital investment efficiency.

Anritsu Pty Ltd
www.anritsu.com

Cabinet solutions

Siemon's cabinet solutions and accessories are now available in light grey.

In addition to existing black (RAL 9011), Siemon's VersaPOD, V800, V600 and wall-mount cabinets are now available in light grey (RAL 7035). Cabinet accessories are also available to ensure a seamless look throughout the cabinets, including VersaPOD zero-U and end-of-row panels, cable managers, blanking panels and PDU mounting brackets. Vertical patch panels, cable trays, cable managers and brush guards used with V800 and V600 cabinets also come in a white or grey, as well as common cabinet accessories like equipment shelves, filler panels, exhaust chimneys, lid dividers, casters and mounting rails.

Siemon's VersaPOD cabinets leverage the vertical space between cabinets and at the end of row for zero-U patching, cable management and power distribution. The V800 cabinet is suitable for high-density data centre environments, while the V600 is particularly suitable for housing servers.

All of Siemon's cabinets are also available as V-Built preconfigured cabinets that come preloaded with Siemon components, including connectivity, PDUs, cable management and accessories to meet specific applications and configurations.

Siemon Australia

www.siemon.com.au

Workflow management solution

The AFL aeRos open, cloud-based, workflow management platform allows users to easily and efficiently manage their test process from end to end. It facilitates two-way communication and data exchange from engineering to project management to your technician in the field.

Project managers can send jobs directly to technicians, defining exactly which tests, configurations and criteria are needed. This reduces both set-up time and mistakes in the field, creating real OPEX savings. Throughout the job managers can monitor a technician's progress, and with real-time access to test results, challenges can be addressed immediately avoiding expensive retesting and unnecessary truck rolls. Data is stored immediately and securely in the cloud enabling access to test results when and where needed.

AFL Telecommunications Pty Ltd

www.aflglobal.com/au

Solar inverter and storage solution

The ABB REACT 2 inverter and energy storage solution includes a high-voltage Li-ion battery with a storage capacity of up to 12 kWh.

The modular solution can grow with the needs of any household from 4 to 12 kWh and reduce electricity charges due to an achievable energy self-reliance of up to 90%. The inclusion of a high-voltage battery (200 V) delivers up to 10% more system efficiency compared to lower voltage alternatives (48 V).

REACT 2 also offers complete installation flexibility, due to the different set-up configurations available. It is quick and easy to install with a simple 'plug and play' connection and an app for installers.

ABB's cloud-based portfolio of digital solutions, ABB Ability, provides home owners with complete control over their solar power usage. It transfers the information on solar energy, home consumption and battery status over a wireless network to the ABB-free@home system access point, which can then control other ABB-free@home devices including heating, lighting and music. It can even be used to power electric vehicle charging solutions such as the ABB AC wallbox and activate smart functionalities based on energy information.

For areas with unreliable power supplies, the solution also offers a backup function to guarantee power in case of blackout.

ABB Australia Pty Ltd
www.abbaustralia.com.au

ODF modules

The Nexans XPLORER Optical Distribution Frames (ODF) modules are compatible with all standard types of frames or cabinets (19″, ETSI, with front or rear fixations).

They provide flexibility and durability to passive optical networks on points of presence where they are deployed. They have been designed on the concepts of symmetry, simplicity, lightness, modularity and robustness.

The XPLORER ODF swivelling modules are reversible. Whether the user needs a right-axis or a left-axis module, all parts remain the same and the side of the fixation can be delayed to the last minutes at the installation phase. They reduce the complexity of the management of ODF passive equipment.

The modules have an improved fibre routing with management of fibres over-length, bending radius and splicing configuration designed to facilitate an intuitive cabling and a constant protection of the fibres. They use materials that reduce the weight by 50%. The separation of the fixed chassis and the swivelling part increases this feeling of lightness. They are adaptable to better fit the needs of each point of presence and can also be reconfigured on-site to comply with all network specificities.

Tested in compliance with IEC 61300-2 for G environments from IEC 61753-1 (-40°C/+75°C), materials were chosen to ensure resistance to chemicals (hydrocarbons and oils), fungi and corrosion, making the modules particularly suitable for large fibre deployments.

Nexans Olex Australia Pty Ltd
www.olexcables.com.au

Cable tester

The Hioki 3665-20 LAN cable tester provides wire map, shield test, cable length, wiring direction for up to 21 pairs and cable length, and is compatible with Cat 6.

The tester is intuitive — plug the cable in and the tests commence, checking all parameters and displaying test results at a glance (split pairs, transposed pairs, reversed opens and shorts).

Up to 21 terminators can be connected (additional terminators sold separately.) This is convenient for confirming the connection destinations of multiple cables and avoids having to go back and forth to change terminators.

The tester is designed to measure for cable length and detect the location of broken or short-circuited wires to an accuracy of ±4% of reading ±1 m. The Hioki 3665-20 meets safety standard: EN61010 pollution level 2 and EMC standard: EN61326.

Power Parameters Pty Ltd
www.parameters.com.au

Circuit breakers

The Schneider Electric Masterpact MTZ is a high-power, low-voltage air circuit breaker with certified embedded Class 1 energy metering.

The Masterpact range includes Masterpact M and NT/NW circuit breakers. The circuit breaker retains essential properties such as footprint, power connection, thermal rating and tripping performance to provide switchboard builders the convenience to use on their existing designs. AS/NZS 61439-1 switchboard type test certificates for NT/NW are also allowed.

The Masterpact MTZ's connectivity, digital capabilities and ability to be seamlessly integrated into the EcoStruxure architecture are said to deliver significant benefits for end users, specifiers, switchboard manufacturers and contractors requiring high-power breakers as part of low-voltage solutions for industrial sites, critical applications and buildings.

The circuit breaker is designed to withstand high-level vibrations in accordance with IEC 60721 (1g @ 2–200 Hz) and is immune to twice the level of radiated disturbance as per the IEC 61000-4 standard.

Schneider Electric

www.schneider-electric.com.au

Security cameras

The Hikvision AcuSense Turbo HD DVRs and ColorVu Turbo HD Cameras allow organisations and individuals to identify and react to security breaches, while also minimising manual interventions and security costs.

Incorporating 11 different DVR models, the AcuSense family uses the deep learning technologies to enhance object detection. Specifically, the AcuSense Turbo HD DVR detects vehicles or humans; filters out false alarms triggered by animals, leaves and other insignificant objects; and minimises time-consuming manual checks. As an additional benefit, the AcuSense Quick Target Search feature identifies and extracts footage of humans and vehicles from vast video datasets automatically, saving staff from searching through massive datasets.

The ColorVu Turbo HD cameras provide bright colour video images 24/7, even in the lowest-light conditions. The camera's round-the-clock colour-boosting capabilities are powered by a large iris and ED optical glass, an anti-glare diffusion lens, large sensing pixels, warm supplemental lighting and a range of other innovative video technologies.

Central Security Distribution

www.centralsd.com.au

OPINION

From connected homes to intelligent homes

Jessica Ekholm, Gartner

Digital disruption is happening right now in the connected home. The disruption we are seeing is the move from a connected home to an intelligent home.

But what exactly is an intelligent home? Well, first of all it is the evolution of the connected home, the next step in how our homes will be shaped and function in the future. The intelligent home learns the behaviours and preferences of people, and in some cases pets, in the home. It adapts to and anticipates their needs. It is a home that uses data gathered from a selection of devices and sensors around the home, but also from wearables and even connected cars. It anticipates the needs of the users in the home and responds accordingly. It is a fully autonomous home that acts on the user's behalf. The key components of an intelligent home are the analytics engine, the artificial intelligence (AI) solution underpinning the solution, and most importantly, a high level of user trust and data transparency.

Alright, so here I am not talking about learning thermostats or smart video cameras, I am talking about a much more integrated system, a system that uses several, multiple data points to create more of a holistic view of the people (and yes pets!) in the home and that acts upon our behalf. There is no denying consumers are shying away from connected home products, partly, because they are "too technical". In customer experience terms we talk about high- versus low-effort experiences and there is a sense that these products are high effort despite them not necessarily being it. An intelligent home, in theory, should lower the friction and effort for users interacting with their homes, no more fiddling with apps, no more shouting to Alexa, Siri, Hey Google, Hello "Whatshisname", no more manually programming schedules. It will be based on contextual awareness and understanding of the moment, if it rains then the sprinkler doesn't go on as 'usual' at 4 am, etc.

Here is an example of how it may work...

Are we there yet? No. Will we get there? Yes. Early adopters are experimenting. Are consumers really ready for it?

But then there is the 'small' issue of the difference between what consumers say they want to do and what they will actually pay for in the end. However, for now I am looking forward to finally being able to create that home that truly knows me, but then I am an early adopter and have all the gadgets under the sun in my home... How about you? Where do you stand?

Gartner's latest report Market Insight: The Move From the Connected Home to the Intelligent can be found here.

The Australian Smart Lighting Summit
11–12 September 2018
Melbourne Convention and Exhibition Centre
www.lightingconference.com.au

SMART CITIES ON FAST TRACK

Councils across Australia are adopting smart technologies to improve livability and efficiency.

The Wyndham City Council in Victoria is using "temperature sensors built into LED streetlights to generate a real-time high-resolution heat map" for their community, according to Marc Cassanet, Environment and Sustainability Coordinator. The project is being implemented in collaboration with Ironbark Sustainability, knowledge partner for the Australian Smart Lighting Summit, and Powercor Australia as distributor.

The Australian Smart Lighting Summit, an annual lighting event focused on street, outdoor, urban and public lighting, is returning to Melbourne this September. To be held from 11–12 September 2018 at Melbourne Convention and Exhibition Centre, the event will feature over 35 Australian and international speakers. It is expected to attract over 150 delegates.

Smart city initiatives are also being implemented in other states across Australia. For example, the City of Gold Coast is implementing one of Queensland's largest LED retrofitting projects. The city began a large-scale rollout of smart, connected street lighting earlier this year, just in time for the Commonwealth Games. This initiative gave city officials an opportunity to test varying levels of energy consumption via metered and unmetered streetlights. This, combined with the lighting unit's ability to be controlled at the tap of a button, allows users to dim certain streetlights or change their colour output.

The Executive Coordinator of the Energy Management Program at the City of Gold Coast, Pamela Bessette, will provide more insights on the project at the Australian Smart Lighting Summit.

The City of Ipswich is using sensor networks to support its smart city plans. The sensor networks lay the platform for community and commercial opportunities, testing technology in the areas of water, waste and lighting management, solar energy, precinct maintenance, traffic management and user engagement, according to the City of Ipswich. Sharon Boyle, Executive Research Officer, Works, Parks and Recreation Department, Ipswich City Council will discuss the project.

Other speakers include: Paul Brown, Managing Director, Ironbark Sustainability; Ian Dryden, Principal – Industrial Design, City of Melbourne; Keith Henry, Technical Sales Manager, ANZ, Telensa Systems; Scotty Hutto, Lighting Services Manager at Georgia Power Co., US; Martin Valentine, Global Design Director, Ligman Lighting; James Quigley, Senior Street Lighting Engineer, Bureau of Street Lighting, City of Los Angeles, US.

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All-Energy Australia
3–4 October 2018
Melbourne Convention and Exhibition Centre
www.all-energy.com.au

THE FUTURE OF ENERGY

The 10th edition of All-Energy Australia, a clean and renewable energy exhibition and conference, will be held from 3–4 October 2018 at the Melbourne Convention and Exhibition Centre.

"All-Energy Australia 2018 takes place at an important stage as we continue to work towards achieving our vision of an Australia powered by clean energy," said Kane Thornton, Chief Executive of the Clean Energy Council, strategic partner for the event.

The event will see more than 180 industry leaders share exclusive insights and projections on how to tackle the future of the energy sector. The speaker list includes representatives from federal, state and local government, Clean Energy Finance Corporation, CSIRO, KPMG, Hydro Tasmania and Siemens.

This year's All-Energy Australia is said to be over 40 times larger than the 2017 event, which means more industry-leading companies showcasing innovations and emerging technologies. Over 180 companies have already confirmed to be part of the exhibitor line-up at All-Energy Australia 2018 including ABB, NEXTracker, Tesla, Fronius, Canadian Solar, SolaX Power, Array Technologies and Ecoult.

The two-day event includes the Grand Networking Event, the Clean Energy Council's Women in Renewables lunch and the Solar Design and Installation Awards, the all new lounge called the Power Club and the Meet the Speakers social.

For free registration and program details, visit the All-Energy Australia website — www.all-energy.com.au.

All-Energy Australia's 2017 edition was attended by more than 6500 renewable energy industry professionals from across the country and overseas, making it the largest attendance on record.

Robby Clark, Exhibition Director of All-Energy Australia, said, "Last year's attendance exceeded our expectations, with queues of people lining up to get into the plenary sessions and exhibition floor. The tremendous success of the event is an indication of the rapid growth of the renewable energy industry."

Compact power supply

MacLean Electrical introduces the latest and most space-saving addition to the Phoenix Contact power supply range. Phoenix Contact's QUINT4 compact power supply offers a system that combines preventive function monitoring and power reserves at a small size.

With a power range up to 100 W, the dynamic boost can be used to supply up to 200% of the nominal current for 5 s to start up heavy loads. For 1.3 and 2.5 A devices, a static boost continuously providing up to 125% of the nominal current is also available to easily extend the system.

Preventive function monitoring provides early warning for system-specific, critical operating states before faults occur. Selectable power thresholds or DC OK signalling enables output parameter monitoring that is adapted to the application.

QUINT power supplies are available in three performance classes — 24 V DC output voltage with 1.3, 2.5 and 3.8 A — either push-in or screw connection; 93.7% high efficiency and long life (under 100 W); have low power dissipation and low heating; have a compact, slim design (90 mm depth); offer a wide AC input range of 85 to 264 VAC; offer wide DC input voltage range of 88 to 350 VDC; and a wide temperature range of -40 to +70°C ensure a high degree of implementation flexibility.

MacLean Electrical (Australia) Pty Ltd
www.maclean-electrical.com.au

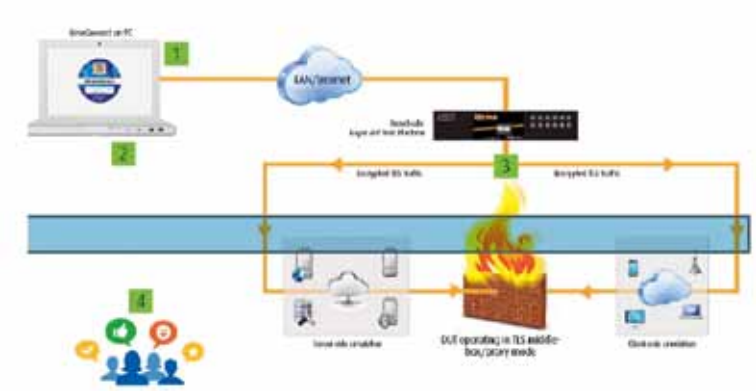
Transport layer security performance testing

Xena transport layer security performance testing (TLS) supports the latest encryption standard. It reveals performance bottlenecks of TLS/HTTPS middle boxes/proxies, addresses security performance testing requirements and optimises security parameters.

SSL/TLS encrypts traffic (web browsing, email, ftp), but it can also encrypt malicious content, such as virus and malware. A lot of security devices such as the next generation of firewalls and packet brokers can now decrypt the SSL/TLS traffic on one side, inspect the content, and encrypt the traffic on the other side, acting as a proxy.

Since these devices (either standalone or combined) can see the decrypted content of the traffic, they can do many things such as antivirus, application on control, intrusion prevention on, web filtering, etc. However, there is a trade-off between security and performance. When inline devices do more computing-intensive jobs, the traffic throughput drops. The challenge is finding the right balance between security and performance.

Xena TLS is a feature in XenaConnect (the free software included with all L4-7 solutions) that makes it quick and easy for test engineers to evaluate different TLS implementation so they can decide which provides the best balance of security and performance. It lets them find the sweet spot of their device configuration or develop better products by providing users with native TLS traffic generation on using up-to-date cipher suites and certificates, so that they can thoroughly test the performance of their devices such as handshake per second, concurrent TLS session and TLS throughput.



TelecomTest Solutions

www.telecomtest.com.au

String inverter

The ABB PVS-100/120 range of cloud-connected, three-phase string inverter solutions is suitable for large-scale commercial, industrial ground-mounted and rooftop applications.

The six-in-one sun-to-socket solution delivers scalability, flexibility, proactive plant management and ease of installation.

It is said to offer quick and improved user experience with fast installation, using the existing module's mounting structure to install the inverter and therefore saving time on logistics, training and site preparation. Installation is controlled and managed via the Installation Wizard, installer app and wireless access, thereby reducing installation time and improving overall user experience.

Smart product design features include secure access via a cover key, PV quick connectors and configuration via Wi-Fi to eliminate the risk of water ingress and further reduce the installation time for cabling, fuse and SPD checks.

The inverter solutions can be easily adapted for any application in large commercial rooftops and free field ground-mounted installations, ensuring that installers and developers are no longer locked into legacy systems. The solar plant can be proactively controlled and managed through ABB Ability with remote monitoring capabilities, parameter setting and firmware (FW) updates to improve operational efficiencies with reduced plant complexity.

ABB Australia Pty Ltd

www.abbaustralia.com.au

Anybus WLAN access points

HMS Industrial Networks' two new Anybus WLAN Access Points — industrial-grade infrastructure hubs for long-range Wireless LAN connectivity — are suitable for collecting data wirelessly from any system or machinery, especially those equipped with Anybus Wireless Bolt or Bridge.

The Anybus Wireless LAN Access Points allow users to set up an industrial wireless infrastructure for multiple wireless clients. Available in two different versions, one for IP30 applications and one for IP67 (outdoor and water resistant), both products feature the same characteristics in terms of range and functionality.

The Access Points enable wireless connectivity to all types of industrial equipment but are especially suited to connect to machinery and systems that are communicating wirelessly via the Anybus Wireless Bolt and Bridge from HMS.

The WLAN Access Points fit into any automation architecture, enabling high-performance wireless connections to a multitude of wireless clients. By supporting up to 1000 Mbps wired Ethernet LAN connection and up to 300 Mbps wireless connections, high data throughput is ensured for each client.

Configuration is done via a web-based interface and secure wireless connections are achieved thanks to support for WEP/WPA/WPA-PSK (TKIP,AES)/ WPA2/WPA2-PSK(TKIP,AES)/802.1X.

Key features include: wireless range up to 400 m; rugged design with IP30- or IP67-classed housing; PoE (Power over Ethernet) supported by the IP67 version; easy configuration via a web-based interface; wireless LAN interface with up to 300 Mbps link speed; industrial quality.

MEPAX

www.mepax.com

Cameras with integrated MxBus functionality

MOBOTIX has released the second-generation Mx6 camera line with integrated MxBus functionality (camera types x16B/x26B).

The MxBus technology is based on an extended camera board. The two-wire cable system developed by the company is encrypted against cyber attacks and expands camera functions by including practical additional modules such as the MX-GPS-Box, a time server for a complete video system.

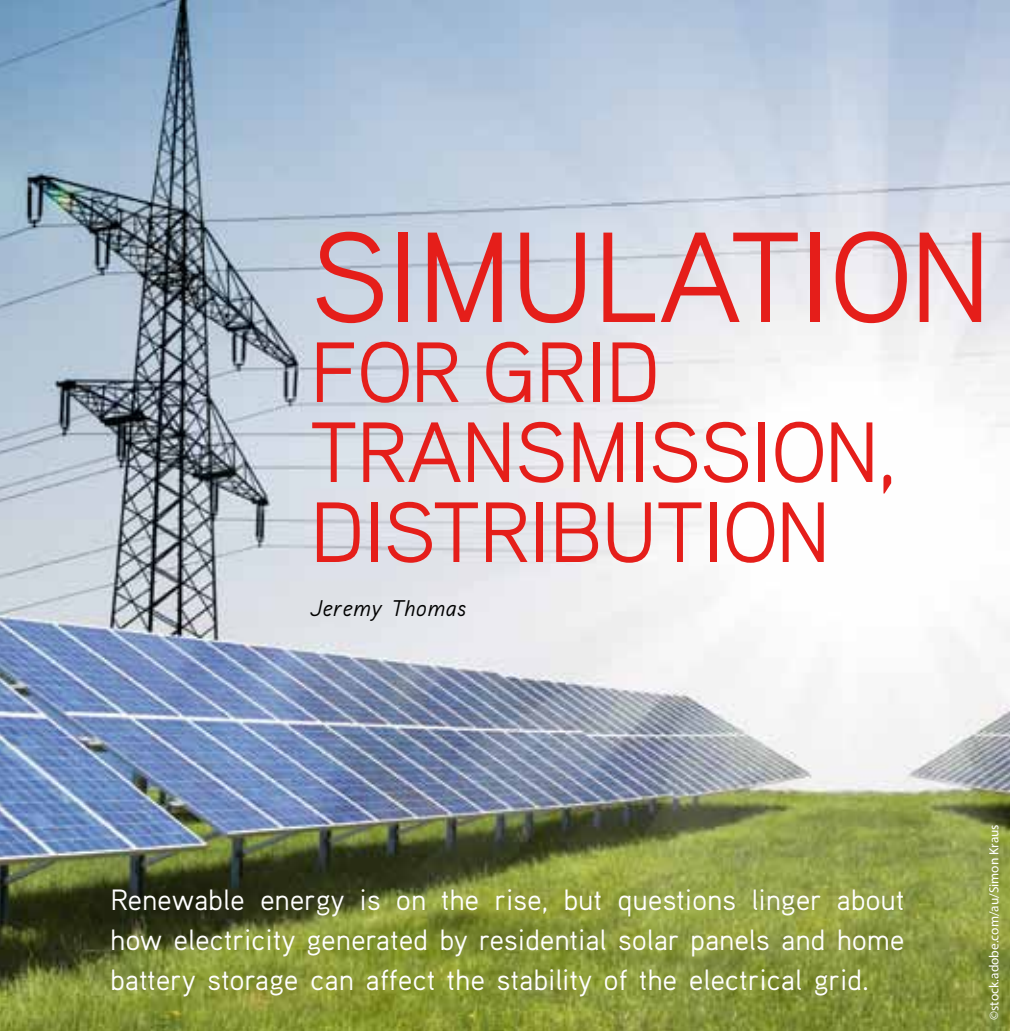
Within the video system, Mx6 cameras without MxBus can also process and use the data from an MxBus module that is connected to a camera within the same network. For example, they can access the time signal from a GPS-Box or activate their own recording through MxMultiSense modules placed at the ceiling of a room via MxMessageSystem.

The x16B/x26B models feature the same exterior structures as the corresponding first-generation Mx6 cameras. This means that all of the sensor modules, mounts and system components they contain can also be used for the latest generation of MOBOTIX cameras.

All first-generation Mx6 camera models (x16A/x26A) are also available as corresponding second-generation camera models with MxBus (x16B/x26B). In order to use the MxBus functionality with the indoor cameras c26B, i26B, p26B and v26B, as well as to add two additional inputs and two outputs to the camera, an additional MxIOBoard-IC is required.

MOBOTIX

www.mobotix.com



SIMULATION FOR GRID TRANSMISSION, DISTRIBUTION

Jeremy Thomas

Renewable energy is on the rise, but questions linger about how electricity generated by residential solar panels and home battery storage can affect the stability of the electrical grid.

©stock.adobe.com/au/Simon Kraus

Traditionally, the grid industry has modelled transmission and distribution grids separately for planning and analysis — electricity historically has flowed in one direction, from transmission lines to the consumers. But as distributed energy resources (DERs) such as solar panels increasingly proliferate and are integrated into the greater grid, coupling the transmission and distribution grids together into computer models has become essential to predicting grid reliability and safety.

Developing such a co-simulation requires immense computational resources, so Lawrence Livermore National Laboratory (LLNL) scientists have kicked off a two-year project with private power management company Eaton Corporation to develop and commercialise a tool capable of performing coupled simulations of transmission and distribution grids. The US Department of Energy's Technology Commercialization Fund (TCF) is backing the project, with a goal of taking the software to market for the power industry to use.

"We have the expertise and the high-performance computing to do it, and the benefit is to help utilities make the grid more reliable and safe, and enable the integration of more and more clean energy, which everybody wants. There's a lot more to do but the vision is once it's completed it will be really useful for stakeholders and utilities who have wanted this capability for a long time," said principal investigator Vaibhav Donde.

LLNL researchers will be leveraging a recent Laboratory Directed Research and Development (LDRD) project that successfully combined the Lab-developed electrical power transmission grid simulator GridDyn with a power distribution system simulation and analysis tool called GridLAB-D, developed by Pacific Northwest National Laboratory (PNNL). The project resulted in an open source co-simulation platform, ParGrid, developed for high-performance supercomputers for conducting coupled transmission and distribution system simulations for power grids.

The new co-simulation tool will bring together GridDyn and CYME — a power distribution system simulation software that Eaton owns — using the framework of ParGrid and HELICS (Hierarchical Engine for Large-scale Infrastructure Co-Simulation).

With licences provided by Eaton, scientists will be installing CYME on high-performance computing machines. Using CYME with HPC will make it computationally superior, researchers said, enabling them to capture the transmission and distribution systems, which hasn't been commercially possible before.

At the end of the project, the researchers plan to make the tool commercially available leveraging Eaton's partnership and expertise in product commercialisation. This new technology is expected to enable the utility industry to run various scenarios of renewable energy integration while looking at longer time scales with increasing accuracy and speed of performance, researchers said.

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ARE YOU WIRED IN PREPARATION FOR THE UPDATED STANDARDS?

With the much anticipated release of the new wiring rules AS/NZS 3000 on June 26 2018, it is critical that installations are protected and comply with the updated standards.

With the much anticipated release of the new wiring rules AS/NZS 3000 on June 26, 2018, it is critical that installations are protected and comply with the updated standards.

In residential installations, all circuits will now be required to be protected by 30mA Residual Current Devices (RCD), this now includes hard wired devices such as hot water systems, ovens and air conditioning systems.

NHP have you covered with a complete range of Residual Current Circuit Breakers (RCBO) and RCD devices to suit these needs with the NHP MOD6 range offering:

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- 1P, 2P and 3P&N
- Switched neutral and un-switched neutral options.

Not only have requirements for residential installations changed but there are also changes for non-residential installations. Formerly, socket outlets and lighting circuits up to 20A required RCD protection, however this has now increased up to and including 32A. All fixed wiring equipment up to and including 32A should now have a 30mA RCD fitted.

To ensure these requirements are met, NHP have complete range of RCBO and RCD devices with the NHP DIN-T offering:

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- 10mA, 30mA, 100mA & 300mA sensitives
- 1P, 2P, 3P and 3P&N
- Switched neutral and un-switched neutral options.

For medical installations or medical equipment in the home, NHP have RCDs meeting the required Australian Standard AS/NZS 3003. These solutions are with 10mA devices with switched neutral in 1P width devices, saving half the space of a typical 10mA RCD.

Higher risk applications such as outdoor equipment, kindergartens, or bathrooms, NHP have a 10mA range of devices to offer that extra level of protection.

When choosing to have upstream RCD protection it is important that special selective RCDs are used. Selective RCDs prevent the upstream RCD accidentally operating which would normally cut power to many circuits instead of the intended individual circuit. NHP also offer these selective type RCDs, Type S.

These changes are improving safety at home and at work so why wait for them to be enforced and make the first step to a safer environment now with NHP.

Ensure you are protected with advanced RCD testing!

Does your RCD operate safely providing protection to personnel and equipment? Regular RCD (Safety Switch) testing is the only way to ensure your RCD operates effectively, this can now be achieved with a Wi-Fi based device, Rapid Test, which removes the tester from live work against other traditional testing methods.

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