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MAKING A LIGHTING IMPRESSION

David Crossley, Technical Manager, Lighting Council Australia

Implementing impressive, interesting and welcoming lighting installations may become more of a challenge for designers and installers under the new energy efficiency provisions (ie, Part J6) of Volume one of the National Construction Code (NCC) 2019. However, there are a number of aspects of the new code that can be used to allow for higher levels of lighting power to be utilised for impressive indirect and architectural lighting designs.

Designers like to be able to use a wide range of lighting effects such as wall wash, cove lighting, uplighting, narrow beam and other types to create spaces that are visually interesting, attractive, welcoming and functional. These types of lighting effects are sometimes not as efficient at delivering light to a work surface or floor as wide beam downlights and troffers. However, they are certainly more attractive and usually lower glare.

Lighting Council Australia and the International Association of Lighting Designers recently ran a series of educational seminars on changes to NCC 2019 and the following tips were highlighted during these events.

Designers should not forget that two conformance paths are available to comply with the requirements of the NCC. One is the performance solution path and the other is the deemed-to-satisfy path.

A performance solution for lighting may use various strategies to achieve compliance. For example, a designer may be able to demonstrate that a particular building management system can achieve overall lower energy usage compared with the deemed-to-satisfy provisions even though the watts per square metre used by lighting may be more than the deemed-to-satisfy provisions. Alternatively, trading increased energy savings in other building service areas (ie, through the installation of a more efficient HVAC system) would allow for more energy to be used for lighting.

From a practical perspective, unless the complete building design is being handled by the one design company or a deal agreed with the building owner and other designers early in the project, a performance solution may not be easy to negotiate.

It is likely that most designs will be completed under the deemed-to-satisfy provisions of NCC 2019. In this case it is important to remember that Part J of NCC 2019 will only be mandatory to apply after 1 May 2020. Up until that date, either Part J6 of NCC 2016 or Part J6 of NCC 2019 can be used. This delayed implementation will allow for new tools such as the Australian Building Code Board Lighting Calculator to be redeveloped and designers to become familiar with the new provisions.

The NCC 2016 track lighting provisions were overly onerous and proved to be a disincentive to including track lighting in designs even

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> THE NEW NCC 2019 PROVISIONS TREAT THE LIGHTING INSTALLED ON TRACK SYSTEMS LIKE ANY OTHER LIGHTING.

though track systems are a practical way to light areas that change over time. The new NCC 2019 provisions treat the lighting installed on track systems like any other lighting. That is, the lighting installed on track systems when the installation is certified is the lighting that is assessed. This is a reasonable approach.

Steve Brown of the International Association of Lighting Designers demonstrated that it is possible for impressive foyer lighting designs including large 'green walls' (ie, interior gardens) to be installed, in part due to the exemption for green wall lighting power. Other types of exempt lighting include that used for fixed display cases, signage, emergency and exit, light heaters, art or sporting performances, museum or art exhibitions, specialist process lighting and plant growth. Steve also highlighted it is best to use the ABCB lighting calculator spreadsheet as this is endorsed by the ABCB.

Sim Steele of Steensen-Varming highlighted that if art is displayed within any commercial space then the lighting power used to illuminate that art is exempt. Such display lighting must be controlled separately from general lighting. Sim also asked the question, "What is art?"

Tim Hanson of GLG highlighted that table J6.2a would be more appropriately titled 'Baseline illumination power density' instead of 'Maximum illumination power density' as additional allowances are able to increase the figures obtained from this table.

Tim also demonstrated through a wide number of examples that designers should always try to utilise the room-aspect-ratio adjustment factor because many common room shapes are able to take advantage of significant lighting power allowance increases via this method.

NCC 2019 has reduced the amount of power able to be used by different spaces within commercial buildings by between 20% and 88%. Some space types such as auditoriums, retail, cafes/restaurants/bars/hotels, lobby areas and corridors have included additional lighting power allowances to enable designers to implement indirect or architectural lighting designs in those spaces. So, the interpretation and classification of a particular space could mean higher power allowances depending on the classification.

Some spaces are multifunction and could be classified in a number of different ways. For example, if food or drink will be served in a space then that space is eligible to use 14 W/m^2 as a baseline allowance. Also, open plan areas may contain a number of different classifications depending on how each part of the floor plan will be used.

All presentations highlighted the significant additional allowances that are able to be used to increase the baseline power allowance. As well as the room-aspect-ratio allowance two controls factors can be used (eg, motion detection, dimming, daylight sensing and dynamic lighting control). Also, two allowances can be used for lighting colour quality. High colour rendering index lighting (ie, equal to or greater than CRI 90) would allow an additional 11% power. Lower colour temperature lighting (ie, equal to or less than 3500K) would allow an additional 25% power to be used for lighting.

So, a maximum of five additional adjustment factors can apply and increase the baseline power allowance for a particular space.

NCC 2019 also includes a number of additional requirements for switching and fire stairs so the new requirements should be read thoroughly. For example, lighting in fire stairs/ passageways/ramps must be controlled by a motion detector.

Sensibly, the exterior lighting requirements can be satisfied by simply installing LED lighting.

Separate to the requirements of the National Construction Code it is interesting to note the outcomes of research recently conducted by renowned Nancy Clanton regarding office worker satisfaction with lighting. The highest satisfaction ratings were obtained using daylighting (where available), the use of up-blinds that brought light into spaces up near ceilings, relatively low levels of general lighting (ie, around 160 lux) and task lighting able to be adjusted by the user. The task lighting should be able to be adjusted up to relatively high illuminance levels. In many cases in the study, workers would adjust their work surface lighting levels up as high as 800 lux or higher. We suggest that such practices are likely to increase alertness and productivity.

Also, the link here back to the NCC is that sophisticated task lighting standalone luminaires are becoming available (ie, including in-built sensors, dimming and split up/down lighting) and plug-in task lighting luminaires are outside of the NCC restrictions.

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FAKE QUEENSLAND ELECTRICIAN FINED $100,000

Both consumers and contractors are reminded to check electrical contractor licenses, after a man has been fined $100,000 in the Brisbane Magistrates Court for posing as a qualified electrician in Queensland.

Amilcar Appel advertised electrical services to households in the greater Brisbane area between November 2015 and June 2017 on the online marketplace Airtasker, despite never having an electrical contractor licence or any qualifications.

The Electrical Safety Office (ESO) found Appel had conducted unlicensed and non-compliant electrical work at nine addresses through Airtasker after receiving a complaint about his work from a licensed electrician.

Appel was convicted and ordered to pay a $100,000 fine for 13 offences under the *Electrical Safety Act 2002*. Four of the 13 offences related to performing dangerous electrical work that exposed individuals to a risk of death or serious injury.

Magistrate Belinda Merrin said while no-one was killed or injured, the potential consequences were significant. Appel failed to make an appearance in court, and Merrin said he had not cooperated with the investigation and showed no remorse for his actions.

This case serves as an important reminder for businesses carrying out electrical work to ensure that all workers hold appropriate and current licences. The community is advised to check their electrical contractor is licensed and to report any suspected unlicensed work, and electrical contractors are encouraged to visibly display their licence number.

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SAPS COULD REPLACE POLES AND WIRES IN REMOTE AREAS

The Australian Energy Market Commission (AEMC) has recommended regulatory changes that enable network businesses to install standalone power systems (SAPS) to provide cheaper, more reliable power for remote customers.

SAPS are usually a combination of solar PV, lithium-ion batteries and a back-up diesel generator that can supply customers not physically connected to the electricity grid.

Providing grid-supplied power to remote customers tends to be expensive as it can require hundreds of kilometres of poles and wires to service limited numbers of people. These changes would not only cut costs, but also offer a safer and more reliable option due to the reduced impact of bushfires.

AEMC Chief Executive Anne Pearson said: "Ultimately, reducing the need for poles and wires to service remote consumers reduces the network costs which make up around 50% of the average electricity bill. It also reduces bushfire risk and the visual impacts of powerlines."

Under the changes, consumers would still have the same protections, reliability standards and access to competitive retail offers as those connected to the grid.

Energy Networks Australia CEO Andrew Dillon described the deployment of SAPS as "a no brainer", but the current regulatory framework prevents distributors from installing them. He said the AEMC's recommendations represented an important step towards making the regulatory framework more responsive to technology and market developments.

"Restrictions on the efficient uptake of standalone power systems by distributors would have led to customers paying higher prices with lower reliability," Dillon said. "Australia needs to utilise new energy technologies and doing so can be a win-win with lower power bills and better reliability."

Trials of standalone power systems are currently underway in several states including NSW, Queensland and Western Australia. For example, Western Power conducted a 12-month trial of standalone power systems technology in 2016 which reduced power outages from 70 hours per year to just 5 hours. The trial is now being extended to over 60 sites in Western Power's network. Horizon Power is also providing 13 standalone power systems for 14 fringe-of-grid properties in Esperance that are serviced by 54 km of ageing powerlines.

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ABB TO SELL SOLAR INVERTER BUSINESS

ABB has instigated its exit from the solar inverter arm of its business, signing an agreement with Italian company FIMER.

ABB's business offering comprises products, systems and services for different types of solar installations that currently sit within ABB's Electrification business, achieving revenues of approximately $290 million in 2018. ABB's solar inverter business employs around 800 employees in more than 30 countries, with manufacturing and R&D sites located in Italy, India and Finland.

FIMER will honour all existing warranties, with ABB compensating FIMER for taking over the business and its liabilities. The deal will cost ABB an after-tax non-operational charge of about $430 million in the second quarter of 2019, with up to 75% to be paid in cash to FIMER. Another $40 million in separation costs is expected in the first quarter of 2020.

ABB expects the operational EBITA margin for the Electrification business to be impacted positively, by slightly more than 50 basis points, supporting the business's progress towards its target margin corridor of 15–19%.

Tarak Mehta, President of ABB's Electrification business, said, "The divestment is in line with our strategy of ongoing systematic portfolio management to strengthen competitiveness, focus on quality of revenue and higher growth segments.

"Solar is a well-established and key focus for FIMER and as such we believe them to be a very good owner for ABB's solar inverter business. The combination of the portfolios under FIMER will support further sales growth.

"Through our intelligent low- and medium-voltage offering, ABB will continue to integrate solar power into a range of smart solutions including smart buildings, energy storage and electric vehicle charging," he said.

FIMER CEO Filippo Carzaniga said, "We are glad to announce this further step in our development, as FIMER's focus on the solar business will be greatly enhanced by this integration. Our commitment to positively influencing the energy market will be realised through the development of new product platforms and innovative digital technologies.

"We will continue the excellent job carried out by ABB in recent years, combining precious resources, knowledge and expertise in Italy and worldwide. With a strengthened portfolio, we are better placed to shape the future of this increasingly strategic business," he said.

Completion of the transaction is expected in the first quarter of 2020.

MEA AWARDS RECOGNISE WA SPARKIES

Master Electricians Australia (MEA) has unveiled the eight winners of the 2019 Master Electricians Western Australia Excellence Awards, with Wilco Electrical and S & K Electrical Contracting being recognised several times.

Frank Mitchell accepted the Master Electrician of the Year Award for the positive impact Wilco Electrical has had on the local community and its diverse operations. The company also won the Energy Efficiency Project of the Year Award for a project that has delivered clean, safe drinking water to remote communities.

Meanwhile, the Women in Contracting Award was presented to Michelle Griffiths, who has overseen her Laser Electrical Bunbury business expand from 3 to 16 staff in a 6-month period.

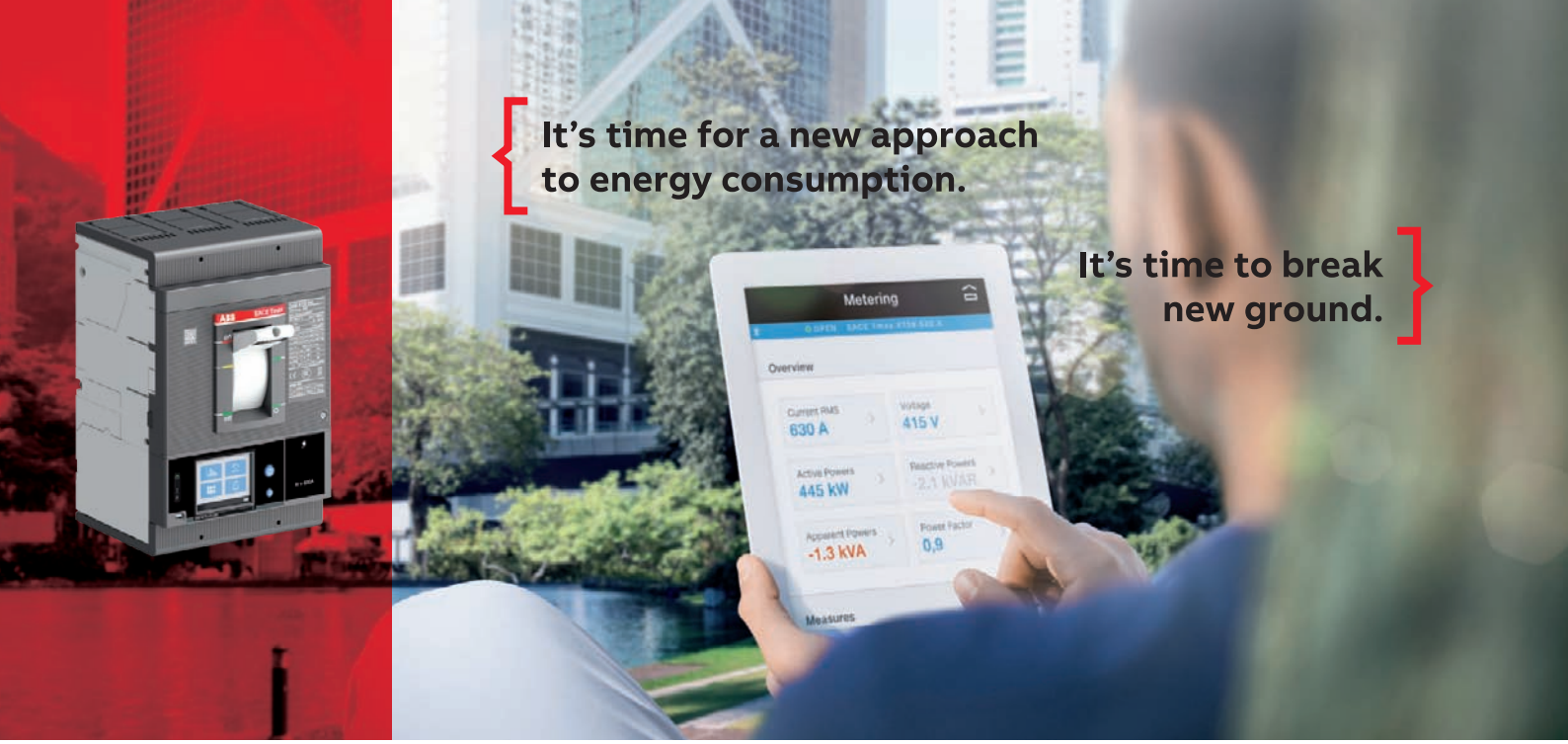
Other winners included:

- Commercial Project of the Year Award — Wei Lim – West State Electrics
- Industrial Project of the Year Award — Steve Villier – S & K Electrical Contracting
- Legrand Apprentice of the Year Award — Joshua Gray – S & K Electrical Contracting
- Residential Project of the Year Award — Matthew Blagden – Prolecko
- Electrician (Tradie) of the Year Award — Darren Jesnoewski – RNM Solutions

"The calibre of nominations MEA received was phenomenal and showcased incredibly high standards regarding quality, safety and integrity — attributes that are the cornerstone of Master Electricians," said MEA CEO Malcolm Richards.

"The individual awards highlighted the dedicated and skilled sparkies MEA has in Western Australia, while the project awards underlined the cutting-edge and innovative business practices that are taking place in the industry."

Richards congratulated all eight winners on their achievements. They will now compete in the National Master Electricians Excellence Awards.



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Four-bay, outdoor shelters

MFB's four-bay, outdoor shelters allow people in remote regions of Queensland to communicate via the state's trunk two-way radio network.

They are powered by a solar array, which sits on top of the shelters, along with a battery bank that is housed in the MFB battery enclosure next to the shelters.

MFB Products Pty Ltd

www.mfb.com.au

Lithium-ion uninterruptible power system

Eaton has launched its 5P lithium-ion rackmount uninterruptible power system (UPS) in Australia and New Zealand. Designed for distributed IT and edge computing environments, the UPS offers increased network security, extended battery life and remote management capabilities.

Building on the success of the Eaton 5P UPS launched in 2013, the upgraded lithium-ion version provides enhanced performance compared to lead-acid batteries, with extended service life and less need for frequent battery replacement.

The 5P is compatible with Eaton's recently launched Gigabit Network Card, which complies with UL 2900-2-2 standard for cybersecurity, providing remote monitoring and protecting against cyber threats.

Additional features of the 5P lithium-ion UPS include: a user-friendly, lightweight design with 20% less weight than a comparable lead-acid UPS; ability to pair with Eaton Intelligent Power Manager (IPM) software; versatile mounting options allowing for simple deployment; less rack space, compact 1U and slimline wall mount for a reduced footprint; and five-year standard warranty on the UPS and batteries.

Eaton Industries Pty Ltd

www.eatonelectric.com.au

MCBs, RCBOs and main switches range

The UniLine range now has a comprehensive coverage, providing users with high-quality, great design and genuine warranty support.

The UniLine MCBs, RCBOs and Main Switches all line up in the board. They have a much smarter more modern look; a new DIN rail fully retractable clip design; a range of busbars and accessories to suit; clear ID flap for circuit identification on all product; and a labelling pack is provided with the product, for quicker switchboard labelling.

All this is covered by the Voltex 25-year warranty. According to the company, if there is a warranty issue, Voltex immediately sends replacements and always aims to settle warranty questions on the same day.

Voltex Electrical Accessories

www.voltexelectrical.com.au

Power quality analyser

The CHK Miro PQ45 Power Quality Analyzer is a weatherproof and compact analyser that is certified to IEC61000-4-30, Class A. It is suitable for power quality analysis, supply compliance checks and voltage investigation, power flow studies, energy audits of solar and railway systems, and transformer monitoring. It is powered from Phase A to Neutral or an external PV with an internal backup battery. The product is available to rent at TechRentals.

The CHK Miro PQ45 has isolated voltage inputs to facilitate various wiring configurations while each channel has its own neutral. Its expansion port allows for system expansion to include additional sensors, input/output controls and custom interfaces, which broadens the PQ system platform. It has built in Phase A supply to cover full 600 V operating range.

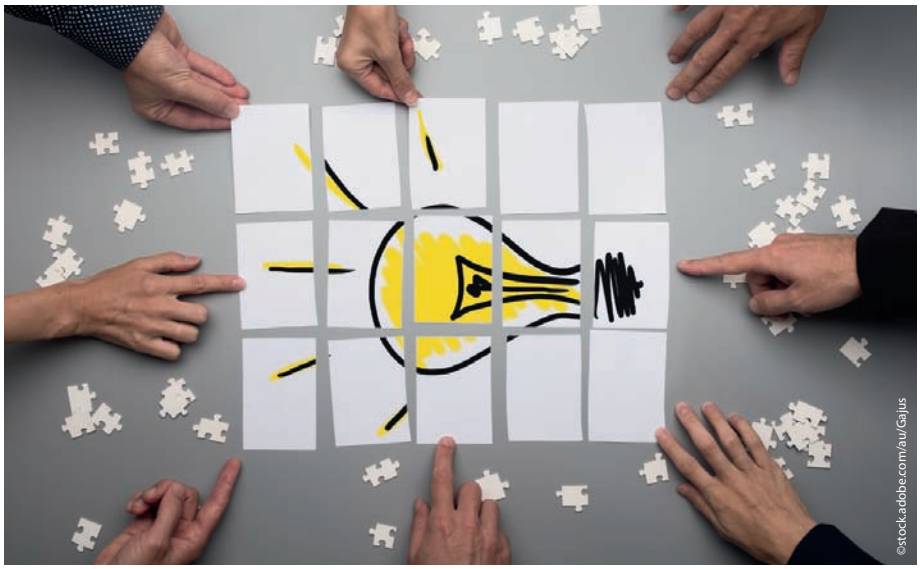
Running on the CITRUS platform, this device is powerful, easy to use and supports all other CHK PQ products, making it an effective tool for device management, data analysis and reporting. It also has LCD display for clear logging status, quick verification for correct installation and graphical colour display.

Additionally, with its gapless logging, users can download data, clear log memory and configure the device with no interruption to logging. Concurrent logging is available at all Class A intervals plus a user-adjustable interval.

TechRentals

www.techrentals.com.au

Piecing together the smart lighting puzzle



Energy-efficient LED street lighting is often seen to be a low-hanging fruit of energy efficiency projects. The energy savings and emission reductions that can be generated by upgrading to LEDs are substantial, with paybacks and financial returns for projects being very attractive.

Street lighting upgrades have been implemented in Australia for several years now and most LED lights are smart-enabled. Although, controls have still not been adopted at scale, even though they offer many opportunities to generate additional energy savings, improve asset management and to support other smart city applications.

This is due to multiple reasons, which are commonly known in the industry and are not the subject of this article. For example, often the benefits for asset management will not flow through to councils because most of their lights are maintained by the utilities. And because most streetlights are classified as 'unmetered loads', additional energy savings from dimming and trimming strategies cannot be captured, plus there are various issues to be addressed around compliance with standards. Many of these challenges are currently being addressed and worked through by industry stakeholders and it seems solutions for some of them are not far away.

However, there's still a strong case to invest into street lighting controls, when considering the role a controls system plays in the broader smart cities ecosystem. Relating to this, a paper published by CSIRO's Data61 suggests that smart cities need a more 'vision-driven' as opposed to 'problem-driven' approach, and that smart cities should in fact be looked at as jigsaw puzzles. Every project and implementation of a solution places a puzzle piece in its rightful place of the big picture (the vision), even though many other pieces don't yet exist. By contrast, a problem-driven approach focuses on technology first and naturally results in fragmentation and walled gardens of solutions that do not interoperate together.

Applying this approach to street lighting controls could be the solution to the earlier mentioned challenges. And there could be other smart applications, which in combination create new and value-adding use cases when lighting is used for its primary purpose — visibility, visual cues, safety and security.

For example, imagine the following use cases:

- You park your car at the side of the road, the streetlights adjacent to the parking spot increase the light levels around you. You feel safe and your car is protected while it's parked out on the street.
- Streetlights indicate available parking spots to you, for example, by changing colour, flashing or by providing other visual signals.
- An accident happens on the road at night, the streetlights brighten the scene for helpers and provide visual cues to alert other drivers and pedestrians to the danger, for example, by flashing a few hundred metres before the crash site.
- Video analytics from CCTV provide triggers for lighting scenes that deter criminal offenders, for example, when fights break out at night. This could include scenes such as increased light levels or flashing lights.
- Lighting could also be used for crime prevention, for example, video analytics can identify persons of interest or loitering, in which case lights can shine brighter to deter people from loitering and make passers-by feel safer.

Because street lighting is ubiquitous in urban areas and lighting at night-time is extremely visible, the opportunities to combine control systems with other applications to create new and innovative use cases are endless.

Circling back to the vision-driven approach and jigsaw puzzle analogy, street lighting controls, like other smart city applications, should be viewed as a system within a system, and only one element in a smart city's foundation to support a multitude of higher-level goals.

As such, councils should always give careful consideration to include a controls system when upgrading their streetlights and to address the problems "here and now" with solutions that contribute to the vision of an ideal integrated future in the longer term. Do not miss the opportunity to place another puzzle piece where it rightfully belongs in the big picture.

Christian Mildner is a Solutions Architect for Sylvania Connected Solutions. He has over two decades' experience in the lighting and technology space having been a former mentor in the CSIRO's ON program and creating and co-founding his own cloud application company, Ooder. He holds a Master of Business Administration (MBA) from the University of Amsterdam as well as a Bachelor's degree in Science from the University of Tilburg.

STANDARDS POWERING THROUGH

In a constantly evolving sector, the energy and electrotechnology domain requires the appropriate foresight, technical knowledge and adaptability to be present within the standards development process.

Through an array of national discussions, consultations and committee meetings, Standards Australia works closely with industry, government, academia and the public to create a collaborative environment to build the robust standards needed.

Hearing Australia's voice in artificial intelligence

The artificial intelligence (AI) space is not slowing down, gleaming with promises and opportunity to benefit daily life. To help guide AI's rapid progress and best unleash its potential, Standards Australia has released a discussion paper, titled 'Developing Standards for Artificial Intelligence: Hearing Australia's Voice'.

The paper was developed to drive responsible AI use and recognise the work of CSIRO's Data 61 and others in shaping how ethics can impact AI into the future.

In conjunction with the paper's release was a comprehensive national consultation process. Meeting with key leaders in the industry, government, society and academia, to listen on their insights and needs for the AI space.

The online and written feedback and face-to-face discussions received from the various roundtable sessions will be collated and used in developing the Standards Australia Artificial Intelligence Roadmap Report.

This roadmap will offer practical, actionable steps for Australian stakeholders to take through the standards process and allow their voices to be heard globally. It will also feature in work already underway at an international level.

To read the discussion or keep updated with AI and standards, visit www.standards.org.au/news/.

Gaining momentum in hydrogen

Acknowledging its capacity for a low-carbon future, enhancing fuel security or creating new investment opportunities, the hydrogen sector has seen a shift — transitioning from exploring technological viability to recognising its market potential.

The committee, ME-093 Hydrogen Technologies, which mirrors ISO TC 197 Hydrogen Technologies, was created when the possibilities of hydrogen in Australia were realised.

ME-093 has had its first kick-off meeting, resulting in the committee now reviewing a catalogue of existing national and international standards to then meet and discuss recommendations. A chairs advisory group formed to ensure that the existing committees are kept updated about the activities of ME-093 and have an opportunity to provide input when necessary.

Standards Australia is now looking at a clear delivery plan to support Australia's Hydrogen rollout benefiting consumers and professionals alike as this alternative energy sector powers ahead.

Revised cabling standards

A series of AS 11801:2019 *Information technology - Generic cabling for customer premises* standards have been revised with a focus on the adoption of international standards, where possible.

The Committee, CT- 001 – Communications Cabling, which mirrors JTC 1/SC 25, revised five standards that overall address characteristics of cabling systems for customer premises including test procedures, planning and installation guides for the Australian marketplace, installers, users and specifiers.

The following standards have been recently published:

- AS/NZS 11801.1:2019 *Information technology - Generic cabling for customer premises, Part 1: General requirements* (ISO/IEC 11801-1:2017, MOD)
- AS 11801.4:2019 *Information technology - Generic cabling for customer premises, Part 4: Single-tenant* homes (ISO/IEC 11801-4:2017, MOD)
- AS 11801.5:2019 *Information technology - Generic cabling for customer premises, Part 5: Data centres* (ISO/IEC 11801-5:2017, MOD)
- AS 11801.6:2019 *Information technology - Generic cabling for customer premises, Part 6: Distributed building services* (ISO/IEC 11801-6:2017, MOD)
- AS 11801.2:2019 *Information technology - Generic cabling for customer premises, Part 2: Office premises* (ISO/IEC 11801-2:2017, MOD)

The international adoption of mentioned standards assists in delivering robust and technically sound guidelines that support the regulatory requirements for the distribution of information technology equipment not only from Australia but from international sources as well.

Standards Australia
www.standards.org.au

Workshop calibration test bench

Beamex has introduced a workshop calibration test bench called Beamex CENTRiCAL. It is designed to combine ease of use, versatility and ergonomics for performing calibrations in a workshop, which can, in some situations, be more effective and convenient than calibrating instruments in the field.

For example, during a commissioning phase, it is easier and faster to calibrate the process instruments in a workshop before installing them into the process. It is also more efficient to calibrate spare devices and rotational spares in a workshop. Accuracy can be achieved when the calibration is performed in controlled conditions using dedicated workshop calibration equipment. In the event of harsh or even dangerous field conditions, calibration in a well-designed workshop with equipment ready for use is ergonomic and practical. Workshop calibration can also complement field calibration.

The product is easy to configure to suit individual requirements, while the standard electrostatic discharge (ESD) protection offers electrical safety measures. Each unit is supplied with accredited calibration certificates to ensure quality and traceability. It is available with ergonomics via motorised height control or as a fixed-height bench. A straight bench as well as corner modules are available to meet user needs. A trolley-based design is also available for mobile solutions.

Combining the Beamex CENTRiCAL together with software, hardware and calibration expertise forms an automated and paperless digital calibration solution.

AMS Instrumentation & Calibration Pty Ltd

www.ams-ic.com.au

Wireless electricity monitor

EpiSensor's ZEM-61 Wireless 3-Phase Electricity Monitor can monitor energy consumption patterns in equipment and buildings remotely via EpiSensor's NGR-30-3 Gateway. This provides facility and energy managers with targeted energy consumption information essential for increasing efficiency and reducing overall power consumption.

The monitor can be configured with a range of CTs and Rogowski coil options to measure currents from 0.1 A to 3kA per phase.

Key features include: quick and easy deployment; 3G/4G communications for data backhaul; monitor and control a wide range of assets (0.1 kW to 100 MW); run multiple programs on the same infrastructure (DR, FFR, etc); monitor pulse or analogue or Modbus outputs from meters, SCADA and BMS; interrupt-based data export for immediate notification of load shedding; full bi-directional control to remote sites using latest IoT platforms and technologies; enterprise class security from sensor to server; and scale to thousands of sites easily.

Metromatics Pty Ltd

www.metromatics.com.au

Outdoor power and equipment cabinet

Eaton has announced its latest outdoor power and equipment cabinet designed to house telecommunications and IT equipment in harsh environmental outdoor conditions. The cabinet is specially designed to withstand Australia's most harsh and hot environments.

The ExoCab18-Macro 100 cabinet is a complete back-up power system with environmental control. Typical applications include 4G and 5G telecom network base stations, road traffic management electronics, railway signalling systems, and other forms of critical radio and IT infrastructure.

The cabinet employs a fan speed controller to manage internal and external airflows and a battery compartment that includes a DC-powered thermoelectric cooler, to pull the internal battery compartment temperature below ambient if needed. The DC-powered fans are speed controlled to minimise energy consumption and noise output. The cabinet also includes external solar shields that help reduce the heating effect from the sun.

The system can be used by mining, water treatment and electrical utilities to house and support communications and control networks.

Eaton Industries Pty Ltd

www.eatonelectric.com.au

Cooling solution for edge data centres

Schneider Electric has introduced the RD300 series of InRow Direct Expansion units. This close-coupled cooling solution is suitable for edge and enterprise customers.

The compact and energy-efficient design makes the unit a versatile and predictable cooling system for next-generation small and medium data centres.

Key features include: up to 30 kW cooling; optimised system design and control drives down power consumption; flexible installations; intelligent controls with cybersecurity protection; and 24x7 monitoring with EcoStruxure Asset Advisor.

Schneider Electric IT Australia

www.schneider-electric.com/ups

Smart panels

SolarEdge has introduced 300 W smart panels to the Australian residential market. Pre-assembled with power optimisers, the smart panels combine with the company's inverters to provide faster and easier PV installations.

They are manufactured on a fully automatic production line with 100% EL triple inspection that is independently verified by PI Berlin.

The smart panels offer design flexibility, panel-level monitoring with real-time performance information, and enhanced safety with embedded SafeDC technology.

SolarEdge Technologies Inc.

www.solaredge.com

Lab quality voltage reference standards

The Fluke Calibration 734C DC Reference Standard is the third generation of lab quality voltage reference standards. It is designed to be an accurate way to maintain and disseminate 10, 1 and 0.1 VDC volt and is designed for laboratories that need to maintain traceability to national standards and distribute the volt to production, service, calibration laboratories or other remote locations.

The 734C adds 1 and 0.1 V outputs to facilitate DMM calibration eliminating the cost and complexity of adding external dividers.

Select models are two times more stable than the base models at 10 V thanks to the process enhancements to the Zener reference technology in the 732A and 732B.

It consists of four electrically and mechanically independent 732C DC standards in a rack-width enclosure. Each standard is small and portable with 72 h of battery life that can be extended to more than 210 h with the optional external battery and charger.

Fluke Australia Pty Ltd

www.fluke.com.au

ARBS 2020
AIR CONDITIONING, REFRIGERATION BUILDING SERVICES EXHIBITION
MCEC // MELBOURNE
19-21 MAY 2020

ARBS 2020

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19–21 May 2020

www.arbs.com.au

ARBS 2020 WILL RETURN TO MELBOURNE

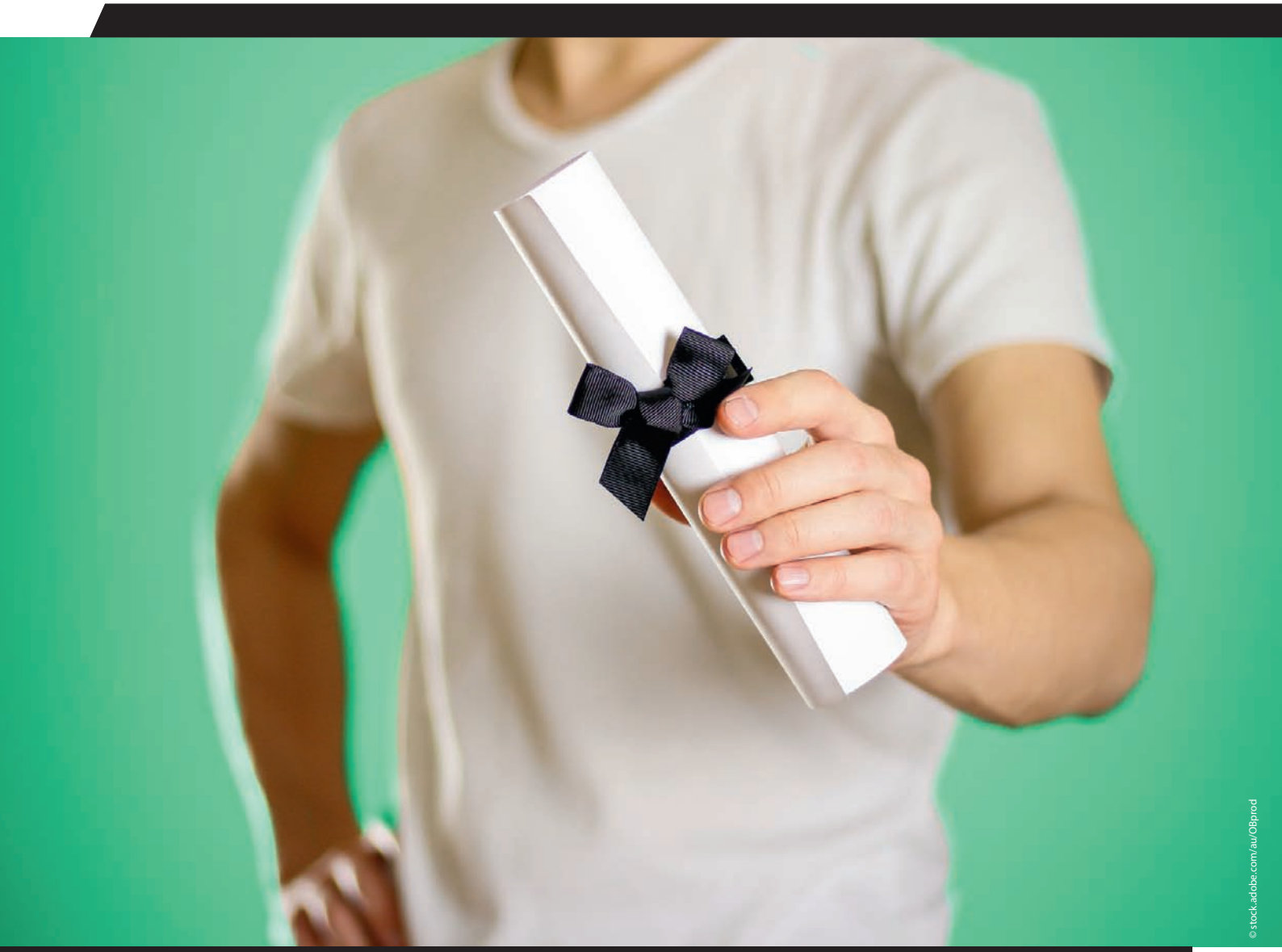
ARBS 2020, Australia's international air conditioning, refrigeration and building services trade exhibition, will bring together more than 350 exhibitors and 8000 visitors to discuss major HVAC&R trends such as efficiency and technology.

To be held 19–21 May, it will showcase new products and technologies that are set to shape the future, with a focus on emerging trends including smart IoT solutions, automation and control, refrigerants and energy efficiency.

A new precinct of the exhibition, IBTech@ARBS, will allow attendees to explore cutting-edge intelligent building technologies and solutions. As smart building solutions continue to evolve, they allow property developers and owners to reduce costs, improve energy efficiency and enhance occupant comfort. Recent advancements have meant greater integration and interoperability between key systems, resulting in highly sophisticated building control strategies.

As well as providing attendees with the opportunity to network with industry experts and peers, ARBS 2020 will also hold informative seminars encompassing both the general HVAC&R and IBTech agenda.

During the three-day event, attendees can celebrate industry achievements at the ARBS 2020 Industry Awards ceremony, held on 20 May 2020. Entries for the awards will open on 1 July 2019, and the categories include Young Achiever Award, Product Excellence Award, Software/Digital Excellence Award, Project Excellence Award, Outstanding Service & Maintenance Award and Outstanding Industry Education/Training Award.



QUALIFICATIONS, CREDENTIALS, CERTIFICATION... WHAT'S THE DIFFERENCE?

Paul Stathis, Chief Executive Officer, BICSI South Pacific

What have you got that shows your knowledge, skills and experience as an ICT professional — certificate, degree, diploma, chartered, endorsed, certified, licensed, registered, credential?

So many 'badges', but which one is for what purpose? You've probably got one or more of these badges, but are they the right ones? Many people incorrectly assume what their badges are actually for, even after the lengthy process of acquiring them.

Put simply, for our ICT industry:

- Qualifications indicate educational achievement.
- Credentials indicate industry achievement.
- Certification indicates commercial achievement.
- Licensing/Registration indicates compliance, or legal achievement.

They all serve different purposes, yet all are interrelated. Some are frequently misapplied, so let's analyse what each badge relates to.

1. Qualifications

Qualifications indicate a level of education, not skill or experience; with the benchmarks typically determined by academia, not industry.

The Australian Qualifications Framework (AQF) sets 10 education levels, from Certificates I-IV, to diplomas, degrees and doctorates. Our industry typically has three qualification 'bands' and associated education:

- Degree (tertiary) to become an engineer.
- Diploma (tertiary) to become a technician.
- Certificate (vocational) to become a tradesperson.

Most people start a course before actually working in industry, so graduating with a qualification is really the start of the learning journey, not the end.

Even 'hands-on' certificate courses don't provide enough time to develop expertise in specific fields. And if you're coming from another industry, say an electrician with plenty of on-the-job skills, a Telecommunications Certificate still wouldn't make you an expert in comms cabling. You'd need to then develop further on-the-job expertise to be truly valuable to clients.

2. Credentials

Credentials indicate knowledge and skill benchmarks determined by industry, typically acquired years after a qualification. For example, a qualified accountant can deliver financial services, but a Chartered Accountant is far better than a graduate accountant. Both are qualified, but a Chartered Accountant is deemed by that industry to be more knowledgeable, skilful and therefore more valuable than the graduate.

The same applies in ICT. Industry associations like BICSI and Engineers Australia (EA) developed benchmarks that identify credential holders as being more knowledgeable and skilful designers than their industry peers. Both require several years of verifiable experience in a specific field before sitting a knowledge-assessment exam. In recognition of the value provided by these credentials, some organisations stipulate that only BICSI credential holders or EA ITEE chartered engineers can design ICT infrastructure for their facilities.

3. Certification

Certification is a term commonly used by cabling vendors who 'certify' installation companies that meet their quality, technical and commercial criteria to be able to offer their extended warranties on installations. Vendors provide technical and practical training on standards, installation and testing to optimise the skills of personnel within the 'certified' company.

This isn't an academic, industry or regulatory requirement like a qualification, credential or licence. It's a commercial arrangement between vendors and installers that qualifies personnel to optimally install their cabling systems to enable them to carry lengthy performance warranties.

Many cablers confuse this with 'endorsement' training for cabling registration. It's important to understand that 'competency' (previously called 'endorsement') training must be 'mapped' to the Australian Skills and Qualifications Authority's (ASQA's) vocational training program, which no certification training is at present, so they can't be classed as endorsement training.

Certification is well worth achieving, because of the significant and discernible value it brings to both certified installers and their clients.

4. Licensing/Registration

Licensing/Registration is a legal requirement of the Australian Communications and Media Authority (ACMA) for individuals, not companies, to install telecommunications cabling. Getting registered requires formal education through a registered training organisation (RTO) and on-the-job experience. This provides Open Registration (often called a 'licence') that allows an individual to install telecommunications cabling in a commercial or residential premises. It doesn't, however, permit them to install structured, coaxial or optical-fibre cabling. This requires further education from a recognised RTO to obtain the respective 'competencies'. As stated above, these competencies don't equate to cabling certification, even though their content can be similar — they have very different purposes.

What to do now?

Figure out what badges you need to do your current job, and identify what badges to which you should be aspiring to become more professional in our industry. Importantly, all of these badges involve education and tests to verify you've learned the right stuff. And that's what the ICT industry needs more of.

BICSI South Pacific
www.bicsi.com.au

INNOVATIVE TECHNOLOGY ENCOURAGES SWEET DREAMS AT CHILDREN AND FAMILY CENTRES

The ability to calm children and encourage their actions are traits that parents have been seeking since the beginning of time. Now, at Knox Children and Family Centres in Bayswater and Wantirna, Victoria, they are using technology to influence these behaviours. Using a Clipsal C-Bus Control System from Schneider Electric, the centres have automated lighting schedules to complement the body's own natural circadian rhythms. This can be used to encourage relaxation or alertness.

This unique application is part of a bigger story. Energy efficiency and ease of use are key to the electrical solution that has been installed at the recently opened childcare and health centres. Large solar arrays and battery storage systems allow each centre to operate off-grid and the latest C-Bus Network Automation Controller uses open communication protocols to share data while delivering accessibility via an easy-to-use interface.

Sleeping soundly

With many components and unique applications, Schneider Electric recommended the services of one of its installation partners, Integrated Electrical Technologies (I.E.T.). Certified through Schneider Electric's EcoXpert program, I.E.T. was well placed to complete the integrated automation portion of the project. The Director of I.E.T., Ray Mintoff, said they worked with the electrical contractor and the owner of the centres, Knox City Council, to ensure the system met all requirements.

"Workers at the centres can select the lighting rhythm they want at a particular time via the touchscreen," Mintoff said. "This gives them

the flexibility to meet the needs of the children throughout the day. For example, in the morning and at meals times, the C-Bus program can be used to alter the lights to a brighter, whiter temperature, which will keep everyone more alert. Then at times when the group is ready for some quiet time, the system can dull down the lighting to a warmer luminescence."

This programming has been enabled by the C-Bus Controllers. The open platform and Lua Scripting Interface controls all schedules and interfaces with multiple touchscreens. The classrooms themselves also have C-Bus occupancy sensors installed. If the sensors detect that a room is empty for 10 minutes, then lights are automatically turned off to save energy. Lighting in the offices and toilets is also automated in this way. In addition, classroom lighting can also be dimmed through the C-Bus interface. A C-Bus DALI Gateway forms part of this solution with DALI fittings incorporated throughout the facility. A 'cleaner's mode' can also be activated, so at the end of the day all lights can be turned on at full illumination to allow workers to easily see what they are doing.

Outside of the building, C-Bus schedules have been used to automatically turn on security lighting. The programming automatically turns lights on 15 minutes before sunset to allow safe passage to and from the car-parking areas. At the Wantirna centre, where the employee car park is underground, lights have been programmed to be on 20 minutes before and after the change in shift at the centre. Lighting for the centre's signage is also programmed to come on before sunset, and to then turn off around 11 pm to save energy.

The results

Completed on time and within budget, the automation solution installed by I.E.T. is reported to be receiving compliments from all those who use it.

"The automation solution was exactly what the project team was looking for," Project Manager John Williams said. "We are pleased with how the system works, providing not only valuable support to staff, but also by providing necessary information to the community via the interactive monitors throughout the facility."

Mintoff said the Clipsal C-Bus Control System was chosen for the job because of its proven ability, and the local support from Schneider Electric.

"I have been in the automation industry for 13 years, and I've seen a lot of automation products come and go," Mintoff said. "The Schneider Electric and Clipsal by Schneider Electric products just work. It is a lot easier to run a business if you know that the products you are using are of exceptional quality."

With seamless integration into Schneider Electric's EcoStruxure Building Operations building management system, the C-Bus Automation Controller is an integral part of the overall energy efficiency of the buildings. And with such ease of use, I.E.T. has created a seamless solution, which appears to be child's play.

For more information, or to find an EcoXpert to talk to about optimising your building, visit www.se.com/au/ecoxpert.

AI-ready box and panel PC

iEi Integration's FLEX-BX200 is an AI hardware-ready system suitable for deep learning inference computing to help users get fast, deep insights into their customers and business. It supports graphics cards, Intel FPGA acceleration cards and Intel VPU acceleration cards, and provides additional computational power plus end-to-end solutions to run tasks efficiently. With the Nvidia TensorRT, QNAP QuAI and Intel OpenVINO AI development toolkit, it can help deploy solutions quickly.

The system also doubles as a modern, ultrafast modular panel PC; it supports several different monitor configurations from 15″ all the way up to 23.8″. Its modular design allows for systems to be quickly swapped out and changed if the user decides more computing power is needed.

The series offers four 2.5″ HDD bays with a high-speed SATA 6 GBps interface that can expand storage capabilities and enable fast data transfers. The system has built-in high-performance hardware for RAID protection to back up media and critical information. Users can configure the RAID 0/1/5/10 from the BIOS menu to increase performance and/or provide automatic protection against data loss from drive failure.

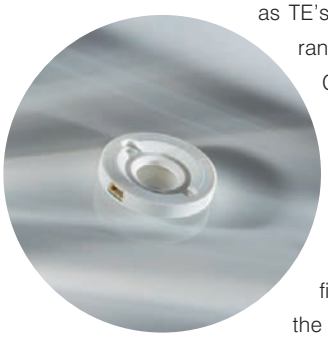
The series can also support Thunderbolt 3 by way of the iEi Thunderbolt 3 card, the TB3-40GDP-R10, to support dual Thunderbolt 3 ports for connecting displays and USB devices and provide more speed.

ICP Electronics Australia Pty Ltd
www.icp-australia.com.au

LED holder

TE Connectivity has announced the LUMAWISE Drive LED Holder Type Z50 DALI-2 (Digital Addressable Lighting Interface) series for chip-on-board (COB) LEDs used in track and spot lighting.

Designed for 48 VDC input, the holder incorporates DC/DC constant current LED driver functionality into a low-profile LED holder, enabling lighting designers to develop more compact lighting products.



It integrates the driver into the same form factor as TE's 50 mm-diameter Zhaga-inspired range of LUMAWISE LED holders for COB LEDs. Until recently, most LED drivers were housed in a box, often larger than the light fixture itself, mounted to the side of the luminaire and remote from the COB light source. This configuration required wiring between the light source and driver, creating design and manufacturing complexity. The holders allow more simplicity and flexibility in lighting design.

Commscope
commscope.com

PoE switches

The SPIDER III range of switches by Hirschmann has expanded to include PoE options to enable fast data transfer over longer distances.

The PoE editions include PoE+ support as well as options for fibre ports in a single device. The units come with a power budget of 120 W, which includes up to eight PoE+ ports.

With jumbo frames support for CCTV applications and DIN rail mounting support, the range can be powered by 12–57 VDC and can withstand harsh environmental conditions due to its IP30 metal enclosure. The range is suitable for use across a variety of sectors and applications, especially automation environments that require reduced cabling.

Control Logic Pty Ltd
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SOLAR STANDARDS
THE LATEST ON THE AUSTRALIAN BATTERY PERFORMANCE TESTING STANDARD PROJECT

Dannielle Furness

Just on 12 months ago, the development of an Australian Battery Performance Standard (ABPS) was announced. Why was the standard necessary and what's the latest news?

Domestic photovoltaic (PV) solar systems are used extensively in Australia. Relative to population, we have one of the highest uptake rates of solar technology in the world. According to the 2019 Clean Energy Australia report, published by the Clean Energy Council in 2018, the number of Australian households with rooftop solar systems has passed the 2 million mark — that's a staggering one in five households.

That high participation rate can be attributed to a couple of things:

1. Plenty of sunshine. Our high levels of solar irradiance mean most Australian capitals boast annual days of sunshine in the mid-200s — an obvious requirement when opting for a solar power system.
2. Our retail energy pricing is among the highest in the world. The result of a range of conditions, including a reliance on non-renewable sources, distribution network upgrades, major facility closures and general wholesale price rises, Australians have been told that high energy prices are here to stay.

No wonder, then, that consumers are seeking alternatives and turning to solar in record numbers, with the battery energy storage market expected to explode in the short term. Despite huge uptake, the absence of a battery energy storage system (BESS) performance testing standard makes it difficult for consumers to make a well-informed choice when investing in home batteries and rooftop solar systems.

Purpose and participants

To alleviate this issue, in June 2018 a consortium, led by testing and certification agency DNV GL, commenced a two-year, two-stage project designed to deliver a draft Australian BESS performance standard (Draft Standard), under which battery performance can be tested and articulated.

DNV GL says the standard is developed for two user groups:

- The primary group is manufacturers (and systems integrators) of batteries and BESS. The standard will provide primary users with recommended practices for testing of BESS components and the associated reporting requirements. This is the information that must be included in product documentation (such as data sheets) and provided to end users.
- The secondary group encompasses end users of batteries and BESS. Here it aims to enable informed choices regarding the performance of different offerings, with respect to the intended application. The standard is designed to provide confidence that the reported performance metrics are relevant and comparable between the different manufacturers' systems.

The Draft Standard will define the series of performance testing protocols and performance metric reporting methods, creating a level playing field for reliability and performance. It relates directly to battery systems connected to a residential or small commercial solar PV system (with a maximum size 100 kW peak power and 200 kWh stored energy) operating under specific Australian conditions. The upshot is to ensure that end users are better informed and can compare systems on a like-for-like basis.

Once the Draft Standard is complete, it will be submitted to Standards Australia to begin the formal process of becoming a recognised Australian Standard. DNV GL says the expected timeframes are lengthy, so the Draft Standard will also be released as a recommended practice for early adoption by industry prior to finalisation of the official standard.

Other members of the consortium and their project roles and responsibilities include:

- CSIRO — predominantly involved in development of the performance metrics, as well as testing various BESS to validate those metrics.
- Smart Energy Council (SEC) — responsible for engaging industry.
- Deakin University — set to develop and validate the recommended battery capacity estimation methodology.

The project is being funded by the Australian Renewable Energy Agency (ARENA) as part of the Advancing Renewables program and by the Victorian Government through the New Energy Jobs Fund (facilitated by the Department of Environment, Land, Water and Planning).

Project scope and timeline

The two-stage project was designed to run over two years, with six months allocated for stage one. It was envisaged that the results of stage one activities would inform requirements for stage two. The project team provided the most recent status update via webinar on 20 June 2019, with everything seemingly tracking to plan.

The now-completed first phase incorporated a comprehensive gap analysis on existing local and international battery performance standards. The intention here was to understand and communicate the current framework and coverage of existing standards and to avoid reproducing work that may already exist. It allowed the team to identify areas where work was needed and should be focused to maximise value.

The team identified and collated 285 standards, codes and best practices, which they then shortlisted down to 124 after determining they were directly applicable to the project. They developed a standard review template sheet and had content reviewed by teams in the EU, the US and Australia.

Stage one incorporated two additional key activities: 1) development of a high-level draft framework for the proposed standard; and 2) a review and analysis of data and outputs from the ARENA-funded Independent Battery Performance Testing project — an independent initiative which tests products under Australian conditions, comparing batteries against manufacturer claims.

The project is tracking on time against all milestones and deliverables. It's moved into stage two, which consists of the following key activities:

- Development of performance metrics and test protocols — the team is currently working on this process.
- Battery performance testing to prove that draft standard methods are appropriate — to be refined as required.
- Development and verification of a generic battery capacity estimation methodology.
- Development of a set of recommended criteria to select a battery management system (BMS).
- Development of a process to identify performance related hazards.
- Recommended minimum set of information for material safety data sheet (MSDS).

The standard is being developed to cover the majority of current battery technologies — or those most likely to be found in a household BESS of the type outlined. Testing within the standard is designed to be as technology-agnostic as possible, allowing for future developments and inclusion of additional battery chemistries.

So, 12 months in and all appears to be on track, with the project team committed to keeping the market informed. If all continues as planned, the Draft Standard will be released as an interim measure this time next year, providing manufacturers, systems integrators and end users with some much-needed guidance.

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.

Due to the possibility of both AC and DC side connection, REACT 2 is suitable for new systems or the retrofitting of existing ones, allowing home owners to improve their energy self-consumption and save on their energy bills.

Highlights include Li-ion battery unit for energy storage (from min 4 kWh to 12 kWh); energy efficiency; suitable for new and existing applications; battery units can be upgraded anytime during lifetime of system; flexible and modular design, optimises installation space; simple and safe installation with plug-and-play connection; system monitoring through dedicated mobile app; Modbus TCP/RTU Sunspec compliant; and compatible with ABB free@home for a full ABB smart home experience.

ABB Australia Pty Ltd
www.abbaustralia.com.au

Portable vibration calibrator

The TMS 9110D portable vibration calibrator is a compact and completely self-contained unit, suitable for electromechanical testing over a wide range of frequencies and amplitudes. It is available to rent from TechRentals.

This vibration reference source operates with digital closed-loop control, for enhanced stability and accuracy. Applications include: field validation of vibration sensors, proximity probes and vibration monitoring equipment; accelerometer checking; velocity transducer testing; and calibration of data collectors and vibration switches.

The device features a wide frequency range of 7 Hz to 10 kHz, an internal memory for up to 500 records and a USB flash drive output. Customisable calibration certificates are compliant with ISO 17025 and accelerometer calibration is as per ISO 16063-21.

TechRentals
www.techrentals.com.au

Modular managed switch

The MSP40 modular managed switch by Hirschmann is available with 10 Gb uplinks via its newly designed 10GE module.

Based on module selection, the switch is available up to a maximum of 28 Gb ports and includes everything from 10Base-T up to 10 Gb SFP+ connections in either layer 2 or layer 3 variations.

Its small size and rugged casing make it suitable for industrial applications that have limited space, such as trackside or in underground mines. The MSP40 with 10 Gb uplinks is suitable for applications requiring significant bandwidth while still requiring an industrial solution.

Control Logic Pty Ltd
www.controllogic.com.au

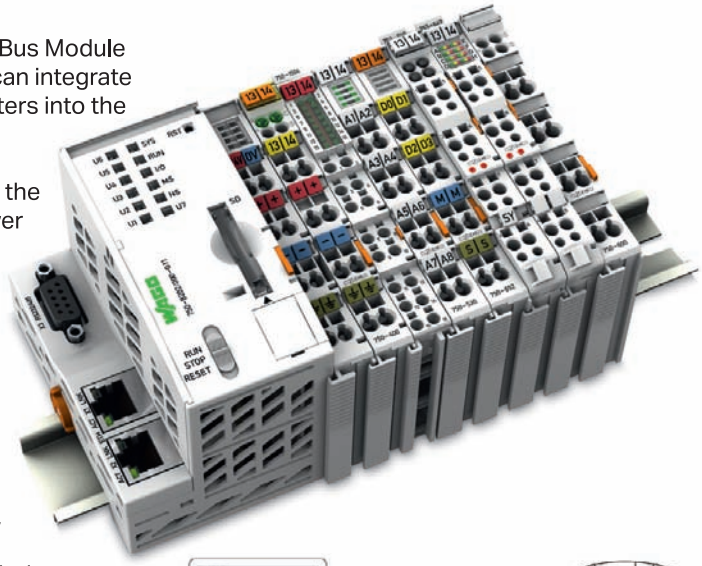
EFFICIENT AND FLEXIBLE LIGHT MANAGEMENT

WAGO Lighting Management is the intelligent solution for lighting control in large spaces, for example, in production halls or warehouses.

Using a combination of predefined hardware and user-friendly software, WAGO Lighting Management facilitates the design and commissioning of new lighting systems, and also offers numerous advantages for their operation.

Solid Hardware

On the hardware side, the new WAGO PFC200 Controller and the DALIBus Module from the WAGO-I/O-SYSTEM 750 form the foundation. Every module can integrate up to 64 DALI lights,up to 16 DALI sensors, and up to 16 DALI transmitters into the system. Since the number of bus modules is variable, WAGO Lighting Management can be used for small production halls, and also in large logistics centers. Furthermore, additional I/O modules can be linked to the controller, for example, 3-Phase Power Measurement Modules for power measurement or wireless receivers for EnOcean wireless controls.

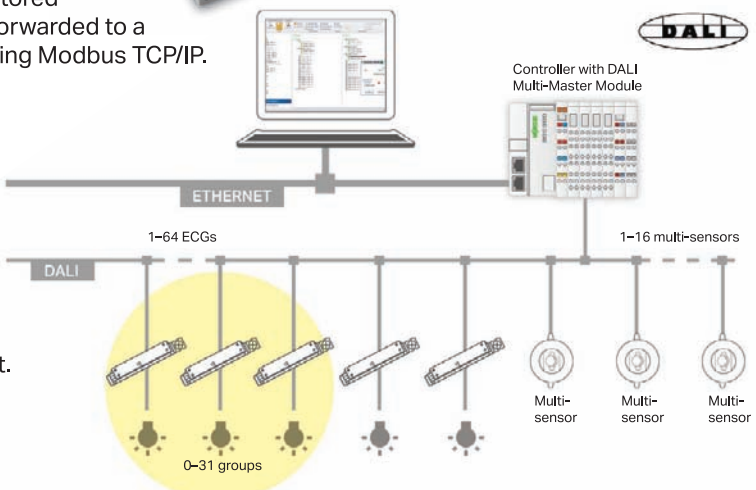


Modern Software

However, WAGO Lighting Management becomes a powerful and user-friendly lighting solution due to the software applications implemented at the controller. All settings, for commissioning and during operation, can be carried out at the controller with the click of a mouse. No programming is required. Since the graphic user interface can be accessed by any standard browser, there is no need for local software installation. The Web visualization, based on HTML5, configures the work with particular ease. Parameter values are stored on the SD card or a backup server via SFTP. The values can be forwarded to a higher level building control or to a production control center using Modbus TCP/IP.

Innovative Operating Concept

WAGO Lighting Management is oriented toward the different light requirements of war houses and production halls. The foundation: the hall is divided into virtual rooms corresponding to the different functions and activities there – for example, assembly lines, traffic paths, or offices. Each virtual room receives signals from the sensors and actuators in order to automatically generate the optimal lighting ratios for the respective tasks, depending on the functions that have been set.



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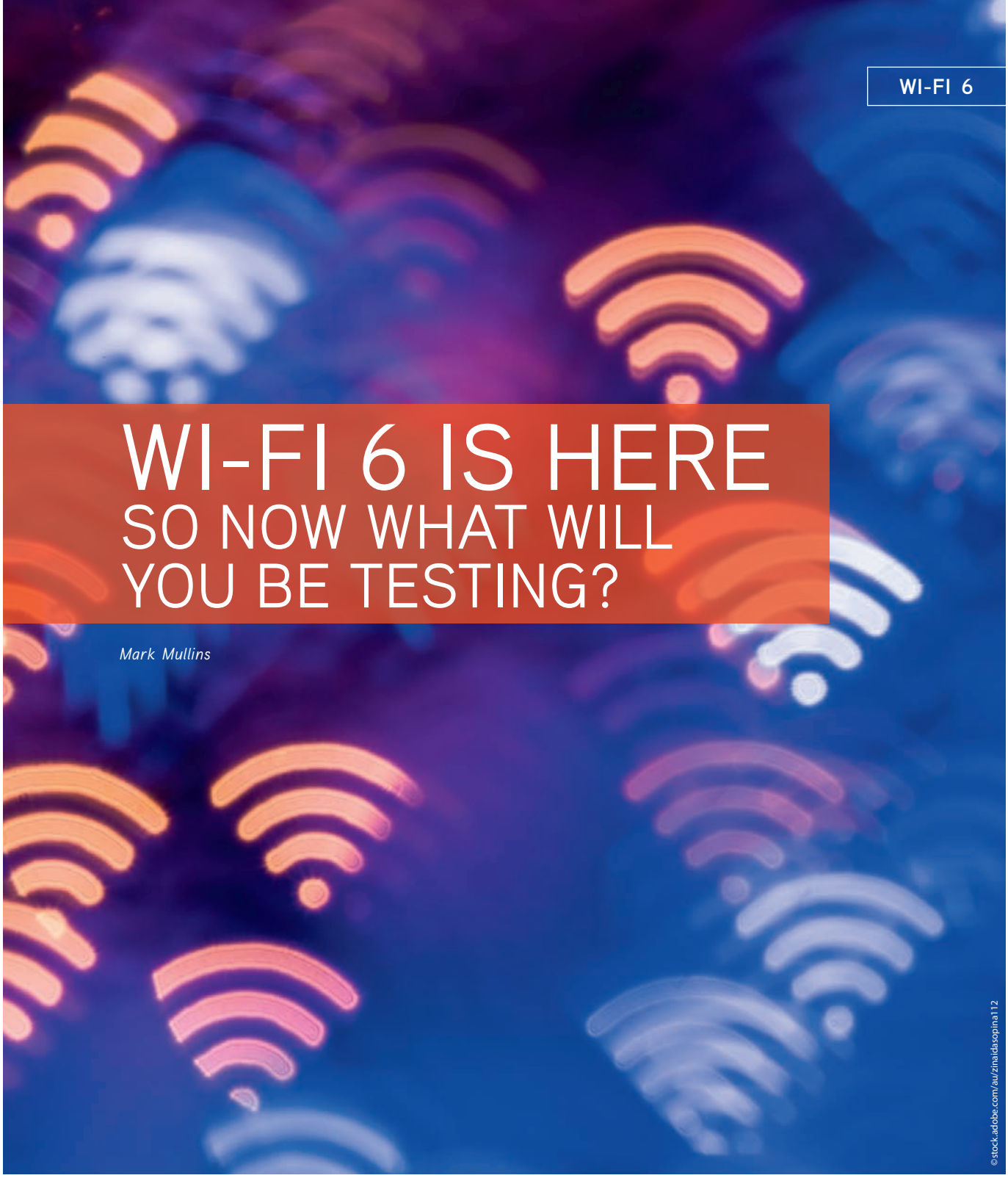

WI-FI 6 IS HERE
SO NOW WHAT WILL YOU BE TESTING?

Mark Mullins

Earlier this year, the IEEE released its 802.11ax Enhancements for High Efficiency Wireless (HEW) LAN standard, known commonly as Wi-Fi 6. This new advanced Wi-Fi application is positioned to theoretically deliver close to 10 Gig transmission through the use of eight spatial streams that each transmit at 1.2 Gbps compared to Wi-Fi 5 (802.11ac) at just 866 Mbps per spatial stream. It also has the ability to operate in both the 2.4 and 5 GHz bands.

When the introduction of Wi-Fi 5 finally gave us wireless speeds beyond 1 Gbps, 2.5GBASE-T and 5GBASE-T were introduced by the IEEE to allow the installed base of Category 5e and Category 6 to potentially provide support. However, not all existing Cat 5e and 6 cable plants are guaranteed to support 2.5/5GBASE-T to 100 metres, and they must be tested to ensure compliance. With Wi-Fi 6 devices hitting the market, now what will you need to test to?

It takes two

While the first wave of Wi-Fi 6 products may be supported by 2.5 or 5GBASE-T, as the second and third wave of products hit the market and push speeds beyond 5 Gbps, two 5GBASE-T connections may be required to each wireless access point to support link aggregation. And as the technology continues to advance and eventually deliver its maximum theoretical throughput, each Wi-Fi

> WHEN SAMPLE TESTING DISTURBED LINKS FOR ALIEN CROSSTALK, REMEMBER TO CHOOSE LINKS WITHIN THE SAME BUNDLE AND THOSE SURROUNDED ABOVE AND BELOW BY CONNECTORS RATHER THAN LINKS THAT TERMINATE AT THE END OF A ROW OF CONNECTORS.

access point may ultimately require two 10GBASE-T connections, which requires a minimum of Cat 6A.

While you might start out testing for 2.5 or 5GBASE-T over Cat 5e or 6 for those customers who have not yet upgraded their cabling plant, most enterprise businesses deploying new cable plants are choosing to go with Cat 6A for Wi-Fi — even if they're only using Cat 5e or 6 for the rest of the horizontal LAN. For those customers, it makes sense to test to 10GBASE-T today even if they're not going to use it right away — and that requires alien crosstalk testing.

Just to refresh, alien crosstalk testing involves testing a sampling of short, medium and long disturbed links for power sum alien near-end crosstalk (PS ANEXT) and power sum attenuation to alien crosstalk ratio far-end (PSASCRF). When sample testing disturbed links for alien crosstalk, remember to choose links within the same bundle and those surrounded above and below by connectors rather than links that terminate at the end of a row of connectors. This will help ensure you're testing worst-case scenario links, and if they all exceed 5 dB in margin, you're in good shape.

If you (or your customer) are not up for the additional time required for alien crosstalk testing (and if you don't need to do it for warranty purposes per the cabling vendor), you can take a look at TCL and ELTCTL test results by choosing (+ALL) limits on the DSX CableAnalyzer Series tester. These parameters only add about 6 seconds to your test times, and they are excellent indicators of whether a cable link will provide adequate alien crosstalk performance. And if the cabling is shielded, you likely won't need to worry about noise from neighboring cables at all.

More power to consider

Another key aspect of Wi-Fi 6 access points is that their more complex processing will require higher levels of PoE than we've seen for previous generations of Wi-Fi that have primarily operated within the 13 W of Type 1 PoE. That means 30 W Type 2 PoE at a minimum, and in some higher-end access points you may be looking at 60 W Type 3 PoE.

If you know the link will be delivering power to a Wi-Fi 6 access point, it would be wise to test for DC resistance unbalance to ensure that when DC power is transmitted via common-mode voltage, it is split evenly between each conductor of the pair and between multiple pairs for four-pair PoE applications. Because if it's not, Ethernet signals can become distorted, causing bit errors, retransmits and even nonfunctioning data links. The combination of high-speed 10GBASE-T, higher power PoE and the fact that more of us every day are connecting wirelessly is what makes Wi-Fi 6 the most significant modern technology substantiating the need for this DC resistance testing — which is available on the DSX CableAnalyzer Series tester by selecting (+All) or (+PoE) limits.

If the cabling plant has already been installed and activated, you can check how much power is available on the link using Fluke Networks' MicroScanner PoE. Simply plug it into the end connection, and if the cable is connected to a PoE switch or other power sourcing equipment (PSE), it will display the class (0-8) of power available on the link. You can then compare that to the requirements of the wireless access point to know if enough power will be available.

Shielded for protection

Because Wi-Fi 6 deployments are susceptible to both alien crosstalk and heat rise caused by delivery of PoE in cable bundles, don't be surprised if some of your customers are using Cat 6A shielded cabling for their access point connections. But don't forget that if it's not installed correctly, even shielded cabling can fail. In the telecom room, a shielded cabling run from one patch panel to another that has an open shield can actually fail alien crosstalk testing.

Simply testing for DC continuity may not be enough. The DC electrical signal will look for any path it can to get to the other end, including through the grounding system to which the patch panels and racks are connected. That means that a tester will show a connected shield even when it isn't. This can be avoided with the DSX CableAnalyzer Series tester, which reports distance to shield integrity issues using a patented AC measurement technique.

This article was originally published on the Fluke Networks blog and is reproduced here with permission.

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Electrical Comms Data news

SMART LIGHTING FOR ADVANCING CITIES

7th Annual Australian Smart Lighting Summit 2019 (28–29 August 2019)

This year's Australian Smart Lighting Summit will highlight the importance of smart lighting within an advancing city, showcasing the latest advances in urban, outdoor, public and street lighting. The event attracts over 200 attendees each year, with this year's summit hosting over 35 Australian and international experts who will present on the shifting nature of the lighting industry.

Agenda snapshot

Delivered through a combination of keynote presentations, case studies, panel discussions and roundtables, the summit will cover the following areas:

- Alight at night — interactive light installations.
- Future — improving our wellbeing with artificial lighting design.
- Panel discussion: blue light — green light or red light? One year on!
- Driving, visibility and LED streetlighting: findings from on-road studies.
- Lessons from Los Angeles — benefits of connected and smart lighting.
- Smart lighting as a foundation for a smart city.

Held at the Melbourne Convention and Exhibition Centre, registrations are currently open.

For more information, visit https://www.lightingconference.com.au.

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Smart pole with IoT applications

The BrightSites smart pole from Signify accommodates a variety of IoT applications, always-on connectivity, cameras and environmental sensors, as well as controllable, energy-efficient LED lighting.

The IoT poles build on earlier smart pole technology by Signify and Ericsson that provides LED lighting and 4G LTE wireless connectivity from small-cell base stations housed within the pole.

Concealed integrated antennas offer 4G and 5G services from multiple carriers. A range of sleek designs allow these poles to match any urban aesthetic.

Some of the plug-in features include: sensors to provide up-to-the-moment environmental monitoring and collect data to support decisions that can enhance livability in urban areas; cameras that can observe road conditions to help improve traffic flows, guide maintenance decisions and emergency crew deployment; smart microphones equipped with advanced pattern recognition that can be triggered by noises associated with antisocial behaviour and automatically brighten the light, record audio and alert emergency services; and display screens that can offer emergency messaging and targeted advertising boards.

Signify

www.signify.com

Fibre-optic test equipment

With a 37 dB dynamic range, FlexScan Quad OTDR tests multimode and singlemode networks (850/1300 nm and 1310/1550 nm), including FTTH PONs and POLANs up to 1:64 split ratio, while still detecting and measuring events <2 m apart.

FlexScan QUAD OTDR maintains the same advantages of the current SM FlexScan, and is designed to enable both expert and novice technicians to quickly, reliably and accurately detect, locate, identify and measure optical network components and faults.

After applying industry-standard or user-set pass/fail criteria, the network is displayed using FlexScan's intuitive, icon-based LinkMap view. Results can be printed to PDF and stored internally or externally. FlexScan automates test set-up, shortens test time and simplifies results interpretation, improving test efficiency and cost.

Applications include FTTX networks and passive optical networks.

Main features include a 37 dB dynamic range; the ability to test Passive Optical LANs up to 1:64 split ratio; easy use for both expert and novice technicians; and quick identification and measurement of optical network components and faults.

AFL Telecommunications Pty Ltd

www.aflglobal.com

Test for digital switchgear

TE Connectivity's ESSAILEC RJ45, part of the ESSAILEC test blocks range, is designed to fit electricity utilities' requirements for safe and reliable testing. Test operations can be made without opening the switchgear panel door and without changing the wiring.

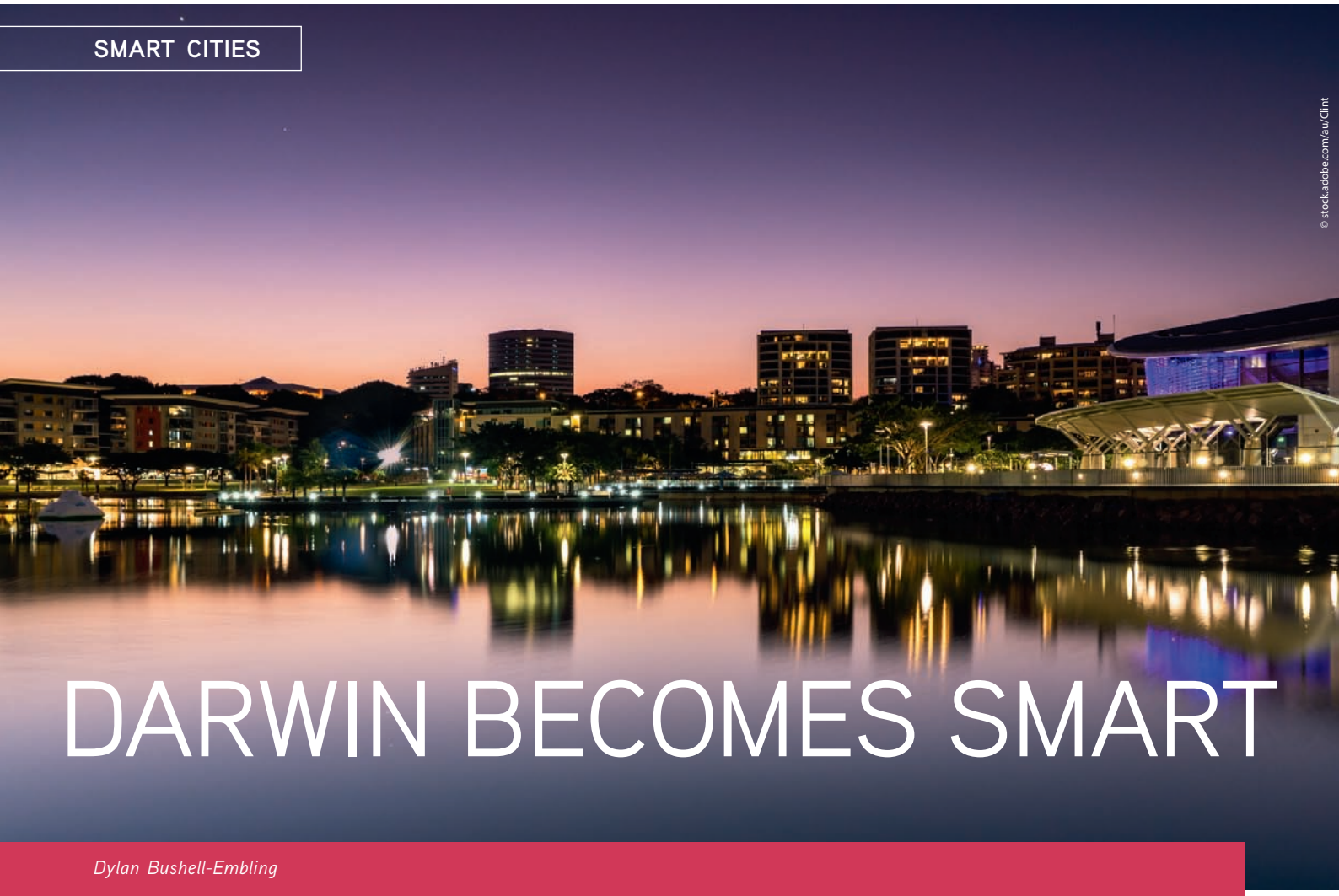
It addresses the test and measurement operations on current or voltage sensors and digital relays.

The product is a compact unit comprising a socket and a test plug, and it uses a 'plug and play' concept. The ESSAILEC socket is installed in the circuit and wired to the device (protection relay in switchboard or meters) to allow test operations during its installation or servicing. The plug will be connected to the test set during test operation to allow sensor measurement or signal injection into the relay.

The combination of the RJ45 connection and the 'make before break' principle makes testing switchgear protection relays quick and easy. The circuit is automatically disconnected when the plug is inserted and reconnects automatically when the plug is removed. The test block's shielded body warranties EMC compliance and signal protection.

Commscope

commscope.com



DARWIN BECOMES SMART

Dylan Bushell-Embling

New LED streetlights, CCTV cameras, free Wi-Fi, environmental sensors and other tech are making Darwin a smarter city.

Construction of the $10 million Switching on Darwin smart city project has been completed, including 912 CBD streetlights being upgraded to LED smart lighting. The project has now moved to the implementation and testing stage, and a fully integrated system is expected to be available by the end of June.

The project was jointly funded by the federal government — which contributed half its budget, as well as the Northern Territory Government and the city council, which provided $2.5 million each.

The LED streetlights have been deployed throughout the CBD to decrease costs and reduce electricity consumption by around 50%. The new lights can be adjusted to help deter crime and sense changes to light levels, and they will give the city the flexibility to tailor lighting for events and activities being held in the CBD.

As part of the project, 138 new CCTV cameras will be installed across the CBD. The locations for the new CCTV camera network were planned in conjunction with NT Police, and will be used by the police force as additional operational tools.

As well as seeking to improve community safety, the cameras will be used for purposes including tracking pedestrian movement, in order to provide data analytics to inform future city and community safety planning.

The CCTV system being installed for the project will not include facial recognition technology, the use of which by city police and government agencies is becoming increasingly controversial — the City of San Francisco last month became the first major US city to ban its use for these purposes. The City of Darwin has pledged to introduce 'appropriate policies and guidelines' to act as additional privacy protections.

The city's free Wi-Fi network has also been expanded with 39 new hotspots, and 24 environmental sensors are being deployed in the CBD and other key areas to measure a range of environmental factors including rainfall levels, as well as CO_2, ozone, nitrogen oxide, dust and noise levels.

This data will be compiled into a dashboard and be analysed by the city, and will be made available at no cost to other organisations on request, with key data posted online on the city website.

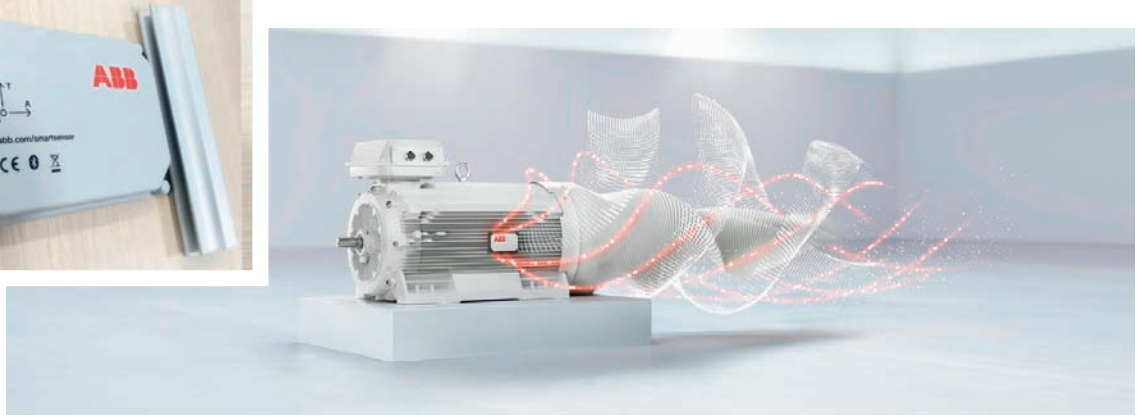
Other initiatives under the project included the deployment of smart sensors for vehicle and pedestrian movement analysis, and smart parking technology.

The city expects the project to enable it to deliver improved and more efficient council services. Providing analytics data to the community and private sector is also expected to stimulate data innovation.

"Completion of this project positions Darwin as a leader in innovation," Darwin Lord Mayor Kon Vatskalis said.

"We now have the tools to improve the livability of our city, the delivery of services to our community and to better understanding our local environment."

The Switching on Darwin project was launched in July 2018. It is one of a number of smart city initiatives being planned across Australia. The Sunshine Coast, Ipswich, Newcastle, Melbourne, Adelaide and other cities all have dedicated smart city initiatives in progress.



Smart sensor for induction motors

The ABB Ability Smart Sensor for induction motors and pumps makes preventive maintenance possible by accurately monitoring and analysing data on motor operation, including health parameters to warn against failures before they happen.

There is no need for wiring as it features built-in Bluetooth 4.0 technology and can easily be attached to any 3-phase AC induction motor for quick configuration. Data from numerous smart sensors can be wirelessly collected via a smartphone app or ABB gateway to securely upload data to the cloud.

The measured vibration, temperature and other parameters can be analysed and converted into meaningful information. The results can be displayed on a customer portal or app via the user's smartphone. Users can gain a quick overview of overall motor condition and monitoring using simple 'traffic light' indicators. Other features include maintenance advice via alarms, alerts and reminders on how to optimise maintenance and save costs. Users can also track data over time for trends or access the data via CSV files for further analysis.

Control Logic Pty Ltd
www.controllogic.com.au

Insulated hand tools

Fluke 1000 V Insulated Hand Tools are designed to keep workers safe in hazardous areas and are rugged enough to use in the toughest environments without breaking.

The 11 new tools are manufactured using state-of-the-art German steel and include all the basics electricians and technicians need to do their jobs safely and efficiently, including an assortment of pliers/cutters and screwdrivers.

The hand tools are rated at 1000 V, but individually tested to over 10,000 V. They are compliant with globally recognised safety standards established by European regulatory agencies to ensure safety when working in live environments. Multi-layer insulation combined with their ergonomic design make these tools comfortable to use all day without strain or fatigue.

The tools are available individually, in multi-tool kits and in bundles with the Fluke Pack30 Professional Tool Backpack, the T6 Electrical Tester, 117 Electrician's Multimeter or 87 V Digital Multimeter.

Fluke Australia Pty Ltd
www.fluke.com.au

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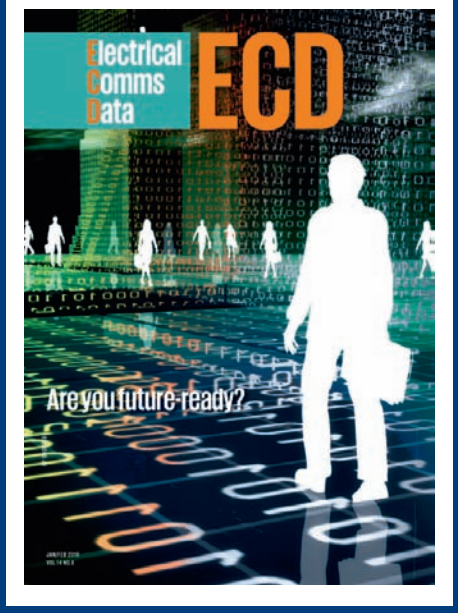

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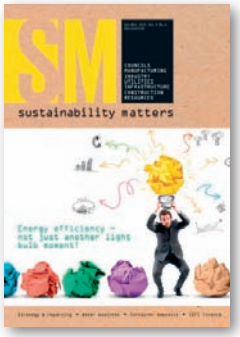

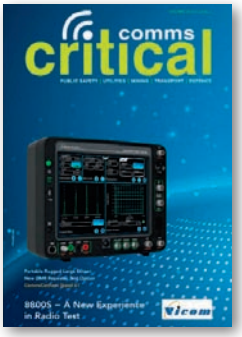

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B2B 101: HOW TO WIN THAT BUSINESS CONTRACT

Greg Waldorf, CEO, Invoice2go

For electricians, winning enough repeat business to achieve consistent cash flow can feel like a never-ending task. One way you can find more reliable, ongoing work is by securing business contracts. While electrical services for homes are always in demand, they are often one-off jobs. However, businesses that have multiple locations often require more electrical attention, which can provide you with more consistent work.

Even if you're a one-person business, or have just a few employees, winning a big business contract isn't out of the question. Demonstrating your services are professional, both in person and online, will improve your chances of securing more substantial contracts. Here are some things to consider to help your one-person electrical services appear just as professional as any large organisation.

Showcase your accreditations

If you're looking to lock in a more substantial contract, it's important to make sure your accreditations and licences are valid and up to date. Many large businesses won't even consider contracting electricians who don't have the right accreditations or permits. These accreditations and licensing requirements may vary between states, so be sure to do your homework. Display your accreditations on all professional letterheads, invoices and estimates to show you're qualified and are the right choice for the job.

Craft a winning estimate

An estimate is one of the first opportunities you have to make a strong impression when going after new business. Sending a clear and transparent estimate helps take the guesswork out of what you're offering, and shows you are capable and credible from the get-go. Mobile tools like Invoice2go allow you to create professional estimates, and send them immediately after a consultation. Even as a one-person electrician, using the right tools can help you give off the impression you're bigger and more established than you are.

Expand your offering

Many large businesses will operate in multiple locations around the country, and they prefer electricians who do too. Consider hiring subcontractors in other states so you can offer your services nationwide and increase your presence. Offering interstate services will also give you a significant advantage over other electricians who limit themselves to local work.

Provide outstanding customer service

No matter how good your electrical services are, your client communication skills also leave a lasting impression. Make sure you're easy to contact and communicate with at every stage of a contract. Making an effort to respond to any enquiries in a timely and professional manner will show you are dependable, even as a one-person electrician. Showing that you'll be easy to work with at the end of the job goes a long way too. Make sure you display all your payment options on your estimate and invoice, and let them know the final part of the transaction will be streamlined and professional as well.

Winning a contract with a large organisation can have major benefits for generating regular work as a one-person electrician. By taking the time to ensure both you and your services appear professional, you'll find it easier to impress clients. That's a key way your business can win larger contracts, secure ongoing work and achieve consistent cash flow.

Invoice2go
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ALL-ENERGY AUSTRALIA 2019

ALL-ENERGY AUSTRALIA 2019
23–24 OCTOBER 2019
Melbourne Convention & Exhibition Centre
www.energyefficiencyexpo.com.au

All-Energy Australia, a national showcase of clean and renewable energy, returns to Melbourne Convention and Exhibition Centre on 23–24 October 2019. The free-to-attend event, held in partnership with the Clean Energy Council, will provide delegates with acces s to the latest technology, information and trends relevant to those working or investing in the renewables sector.

Since 2009, All-Energy Australia has provided a platform to celebrate the renewable energy sector's successes and discuss the challenges and new market opportunities for Australia's energy system.

The 2019 edition takes place at an important stage of unprecedented growth in the industry. At All-Energy Australia, you will be able to witness the latest technologies, products and services, talk to the experts and hear from more than 200 world-class speakers about developments and trends of the renewable energy sector.

In addition to two days of presentations across a six-stream program, delegates can participate in workshops and explore the exhibition floor to source the latest renewable energy technologies. Over 250 exhibitors will attend, ranging from start-up companies to market leaders in the industry.

A meet-the-speaker social event will also be held over drinks and light refreshments at All-Energy Australia's official hotel partner, the Pan Pacific Melbourne. This event will take place on 22 October 2019 (5.30–7.00 pm) at the bar section of Dock 37 Bar & Kitchen, Lobby Level, Pan Pacific Melbourne.

A Grand Networking Event on the evening of Wednesday, 23 October 2019 will also be held, with further details to be released soon.

All-Energy Australia 2019 will be co-located with Energy Efficiency Expo and Waste Expo Australia, forming a comprehensive showcase of renewable energy and sustainable solutions.

Smart UPS

The Schneider Electric APC Smart-UPS On-Line SRT1000XLI 230 V has been developed to handle demanding power conditions, where uptime and efficiency are critical.

The UPS provides double-conversion online technology and advanced management features. It is suitable for power protection for server rooms, network closets, edge computing and distributed IT, and can be used for verticals ranging from health care, retail, finance to manufacturing and even industrial automation.

Key features include good power density; an ability to operate without battery and to protect equipment when power returns after a complete discharge of the battery; a built-in energy meter that measures energy use and displays UPS efficiency in various modes of operation for easy energy tracking; a smart-slot which provides the ability to add in a network management card to manage and monitor the UPS remotely (card sold separately); optional additional battery packs can be added to meet aggressive runtime demands; and >97% efficiency, which saves utility and cooling costs.

Schneider Electric IT Australia
www.schneider-electric.com/ups

Thermoplastic terminal indoor enclosures

NHP has expanded its line of N-Line Thermoplastic Terminal Indoor Enclosures, releasing four additional sizes with increased depth to expand the user's choice.

Available in 13 sizes, this range provides flexibility dependent on installation requirements. Providing IP65 ingress protection and IK07 impact resistance protection, these enclosures provide a defence against water and dust ingress.

Complementing the grey base (RAL 7035), there are options of grey or transparent covers, both of which are halogen-free and RoHS-compliant, offering smooth covers for printing and signage for customised solutions.

This range allows for mounting plates and pre-cut DIN rail to suit, having wire seal compatible cover screws to ensure anti-tampering.

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PROTECTING YOUR PLC

John Young, APAC Sales Director at industrial equipment provider EU Automation, gives his advice for keeping your programmable logic controllers (PLCs) safe from cyber attack.

Programmable logic controllers function at the heart of an industrial control system, managing and controlling various steps in the manufacturing process. As technologies levied by the Internet of Things (IoT) have improved connectivity, manufacturers can remotely access their PLCs for more flexible maintenance and real-time monitoring.

Connectivity may be one of the PLC's greatest strengths, but it is also its silver bullet. When Dick Morley invented the humble PLC in 1968, the internet didn't exist. Today, for the PLC to perform its monitoring and control processes, connection is essential. At the same time, it is this connectivity that exposes it to cyber attacks.

The great PLC hack

Every step forward in the development of the PLC is matched by an advancement in the sophistication of cyber attacks. The Stuxnet worm was first uncovered in 2010 and is believed to be responsible for causing substantial damage to Iran's nuclear program by gaining access to computers through a USB.

Although the hack was carried out on an air-gapped facility that wasn't connected to the internet, the malware ended up on internet-connected devices and quickly began to spread.

When the Stuxnet worm infects a computer, it finds out whether it is connected to a specific model of PLC. The worm then alters the PLC's programming and therefore impacts the processes in a plant. For example, the worm can cause centrifuges to be spun too quickly and for too long, causing damage to the equipment. Because the PLC is communicating that everything is working as it should, it is difficult for the control system or an employee to detect what's going wrong until it's too late. Reportedly, Stuxnet ruined 20% of Iran's nuclear centrifuges.

Stepping up

As connectivity increases, cybersecurity must become a top priority. A robust security strategy begins with people. How many members of staff consider cybersecurity as their responsibility? And how many would still use a USB even when not authorised or aware of what's on it? A need-to-know policy should be default in any plant and developing the knowledge of staff is a crucial aspect of building a security framework.

Manufacturers can also reduce the risk of cyber attack by limiting the number of people that access connected devices. Several workers may need to access a PLC to monitor and control various processes on the factory floor. By creating individual accounts that only give the level of access that is necessary to each worker, managers can easily track and monitor their staff's actions while preventing people from accessing data that they are not trained to handle.

PLCs have very long lifespans. Running an average of 20 years, many in use today have been in operation since a time when cybersecurity was less of a pressing priority. At the same time, upgrading to the latest PLC on the market can be a major investment, which isn't always viable for smaller businesses. Manufacturers should partner with a reliable industrial parts supplier, like EU Automation, to ensure they are able to purchase the best PLC for the job.

Manufacturers are constantly stepping up their cybersecurity game, but so are cybercriminals. To limit damage to their plant, manufacturers should prioritise security, one PLC at a time.

EU Automation
https://www.euautomation.com/au/

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CASE STUDY

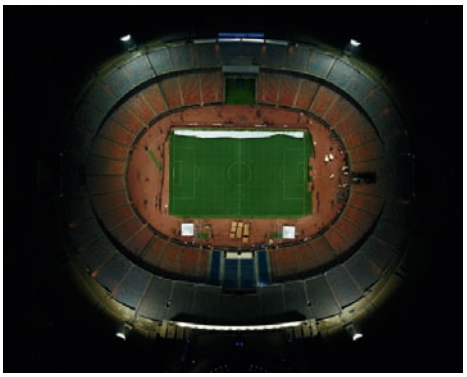
Lighting up Egyptian stadiums

Images courtesy of Signify

Five stadiums in Egypt have turned to Signify to provide the lighting for the Africa Cup of Nations 2019, the biennial international men's football championship of Africa, held from 21 June–19 July 2019.

Signify (formerly Philips Lighting) was selected to replace the old, conventional luminaires in the Cairo International, Alex, Suez, Ismailia and Salam stadiums with new luminaires. Its lighting meets the stringent broadcast standards for flicker-free Ultra-HD 4K television.

In total, 960 Philips ArenaVision luminaires were installed, ranging from 1200 to 2500 lux, meeting the standards of the Confédération Africaine de Football (CAF). Signify completed the project in less than three months, working on the five stadiums from March until June together with one of its Egyptian partners and the governmental contractor under the supervision and cooperation of the Ministry of Youth and Sports.



Kees Klein Hesselink, International Key Account Manager Arena Solutions at Signify, said: "Through these installations, fans and television viewers around Africa and the whole world will enjoy their favorite game while soccer players on the field will get optimal visibility."

"Our goal was to innovate and develop the stadium's lighting to meet the broadcasting standards and renovating the entrance of Cairo Stadium with the latest LED façade lighting technology as well," said Mohamed Abo El Azayem, Market Leader North East Africa at Signify. "Our successful partnership with Cairo stadium dates from 1991, and we installed the first ArenaVision LED lighting system for part of the stadium in 2016, which was the first ever in Africa."

The company has previously given the Cairo Opera House a lighting makeover, preceded by a similar lighting initiative with Egypt's renowned Baron Palace in Heliopolis, The Egyptian Museum and also the Manial palace this year. Thanks to these projects, both the Cairo Opera House and historic palaces have been able to reduce electricity consumption by 80%.

Signify
www.signify.com

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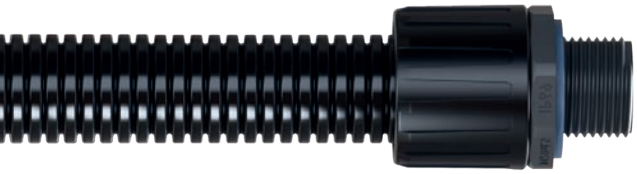

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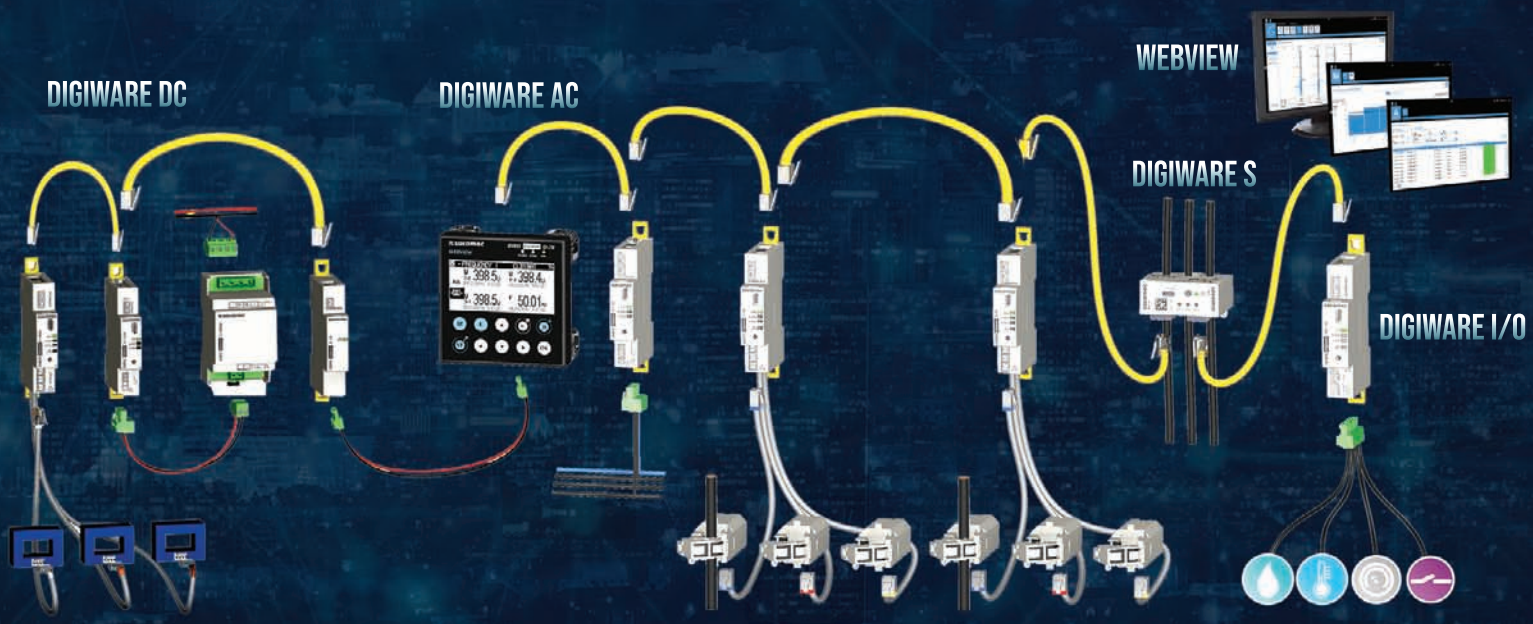

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