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executive/supervisory experience plus supervision of staffs. The purpose of this programme is to promote the improvement of salary, personal promotion qualification and to increase self-confidence.



At the RPL talk – Speaker, Ir Dr Jacob Yan Ngai Nen presenting the RPL form to PES President Mr. Bunny Teh Bung Nee.



The Perak Electrical Association

No. 12-A, Jalan Datuk Mahmud, 31650 Ipoh,
Perak Darul Ridzuan.
Tel: +605-254 1502 Fax: +605-250 9145
E-mail: multipower99@gmail.com /
peaipoh@gmail.com

Academic Excellence Awards

The 29th Academic Excellence Awards of the Perak Electrical Association (PEA) was held on 12th June 2016 at the PEA premises. A total of 36 children of PEA members received the awards which were presented by TEEAM President, Mr Chan Kaim Sam. The awards were sponsored by Mr Wong Kee Keong (PEA Deputy President).

The noble objective of the academic awards is to be an encouragement to build up more confidence for students in their studies. It was both a proud and joyous occasion for all the recipients including their family members.



Well done! – All the recipients posing with the PEA Council after the Awards Presentation.

Self-Test RCCB Safety Campaign

PEA once again supported TEEAM in jointly organising the Self-Test RCCB Awareness Roadshow at AEON Ipoh Station 18 Shopping Centre on 4th and 5th June 2016. The roadshow disseminated much-needed information to the general public on the importance of frequent testings of RCCBs. The response to the Campaign was encouraging and these efforts were targeted for the benefit of all.



Thank you – (Right) PEA President, Mr Chan Kaim Sam received a certificate of appreciation from Ir Chew Shee Fuee KMN (TEEAM President).

PEA at TEEAM AGM

On 29th May 2016, PEA President Mr Chan Kaim Sam was present at TEEAM's Annual General Meeting (AGM) which was held at the Armada Hotel in Petaling Jaya, to approve the annual report and annual audited accounts. The AGM adjourned with a buffet lunch.



Strong support – TEEAM AGM 2016 in progress.

Other State Association Members' contacts:



Malacca Electrical Contractors and Traders Association

No. 389-G1, Taman Pringgit Jaya,
Jalan Mata Kuching, 75400 Melaka.
Tel: +606-283 8688 Fax: +606-781 1466



Negeri Sembilan Electrical Engineering Association

c/o No. 194, Jalan Pantai, 71000 Port Dickson.
Tel: +606-647 1105 Fax: +606-647 4728

Sandakan Electrical Engineering Association, Sabah

Block B-2, Lot No. 25, Bandar Utama,
Batu 6, Jalan Utara, 90000 Sandakan, Sabah.
Tel: +6089-666 963 Fax: +6089-669 936
E-mail: mintzechin@gmail.com

*An ounce of prevention
is worth a pound of cure*

- Benjamin Franklin

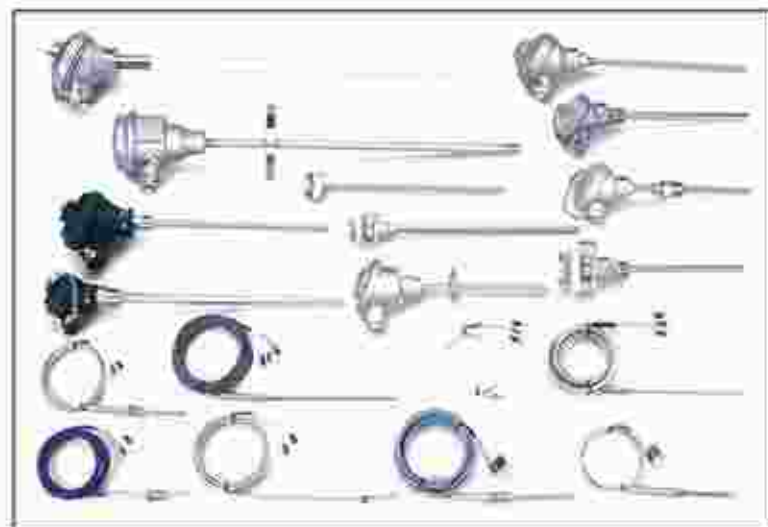
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IEM EETD – TEEAM Collaboration

A special dialogue session between the Institution of Engineers Malaysia (IEM) Electrical Engineering Technical Division (EETD) and TEEAM, was held for the very first time on 28th July 2016 at the TEEAM Conference Room in KL. EETD was represented by Ir Yau Chau Fong, Ir Francis Xavier, Dr Siow Chun Lim, Mr Leong Yun Zi and Mr Chong Siew Long. They were cordially welcomed by TEEAM President, Ir Chew Shee Fuee KMN, and his Exco members. The meeting started with Ir Yau Chau Fong (EETD Chairman) briefing TEEAM on IEM and EETD and the potential future events such as the ASEAN Federation of Engineering Organisations (AFEO) Energy Tour and IEM-Standards Malaysia Symposium, which may require TEEAM's collaboration and support. This was followed by Ir Chew Shee Fuee KMN, outlining TEEAM's its roles and functions. After the conclusion of the introductory session, a lively and frank discussion took place.

The following were the successful outcomes from the above discussion:

- Potential MOU signing between IEM and TEEAM. The objective of this MOU is to create stronger ties between the two esteemed

Associations, including undertaking jointly-organised activities with each other, articles for publications as well as mutual guest membership invitations.

- Potential IEM-TEEAM collaboration in issues such as:
 - « Construction contract matters, especially those involving electrical and electronic contracts
 - « Electrical safety equipment trainings for households on the usage of water heaters and Residual Current Devices (RCDs)
 - « Joint effort in the promotion of Public Safety and Awareness Campaigns pertaining to water heaters
 - « Jointly-organised Courses related to electrical and electronic matters
- Promotion of IEM EETD's upcoming activities including the IEM-Standards Malaysia Symposium and the AFEO Energy Tour, which TEEAM can help support

The inaugural IEM EETD-TEEAM dialogue was a successful one for both the Associations. It was adjourned and followed by a group photo session.



Fruitful meet – Lively discussion.



Attentive – IEM EETD delegates.



All smiles – IEM EETD and TEEAM delegates focused on building a win-win smart collaboration.

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Motor & Magnetic Expo and CIWSIME

Motor & Magnetic 2016 Expo is an international trading platform which has been organised by Wise Exhibition for thirteen years in Shenzhen, China. The 2016 Expo held from 24th to 26th May 2016, was a combination of Information Exchange, Products & Technology Display, Industrial Summits and Conferences. The area covered is approximately 15,000m² with a total of 320 Exhibitors gathering for the event. The exhibit scope covered all kinds of electric motors, magnetic materials, testing equipment, accessories and components.

As for 2016 CIWSIME (Coil Industry, Winding System and Insulation Materials Exhibition), it is an international event that was held concurrently at the Shenzhen Convention & Exhibition Centre. Both the exhibitions attracted some 20,000 visitors. The concurrent events included the Summit, Conference and also the Industry Supply and Demand Meeting. TEEAM is privileged to be one of the supporting organisations. TEEAM participated as an exhibitor and organised an official delegation to visit both the exhibitions.

Overall, it was a fruitful trip for our TEEAM delegates.



Warm welcome – Organiser, Wise Exhibition welcoming TEEAM's delegates.

Motor & Magnetic Expo and CIWSIME





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TEEAM Specialised Group – Manufacturing

By the Chairman, Mr Subramaniam Karuppan

R&D in the Electrical & Electronics industry plays a pivotal role in Malaysia's economy. As one of the leading developing countries in Asia, it is absolutely imperative that we as Malaysians pour our faith into our very own engineered products. In order to achieve this level of faith and trust by consumers, we need to carry out field trials of sizable quantities to achieve uncompromising quality. However, carrying out such field tests require a huge sum of money where funding is very much required.

To stimulate a robust growth to this industry, receiving funding is necessary. One of the few prominent problems that Researchers in the E&E field face is the lack of accessibility and sufficiency in funding despite the presence of numerous bodies facilitating grants. As an example, securing a patent is a costly process for E&E Researchers as it could easily sum up to tens of thousands of ringgit. The Government, as one of the main entities that facilitates these bodies, should encourage Malaysia-made products and not having preferences towards foreign-made products. This in turn this would lead to a more receptive perception amongst consumers.

To become a more developed nation, the Government's support in R&D is just as important in stimulating economic growth. In my past few years of experience as Chairman of Manufacturing in TEEAM, I have attended programmes held at various Government Agencies, with the idea of enhancing the R&D in the E&E sector's development in Malaysia. Based on personal observations, most of the Agencies seem to be replicating each other's products and ideas.



*Mr Subramaniam Karuppan
ksmaniam@datmeltech.com.my*

One of the few solutions to this underlying problem is to consolidate all these Agencies into a single entity. This would effectively result in this new body providing more thoughtful decisions and enforcing all Government Agencies to ensure impeccable quality in the manufacturing of products. In such a manner, we can develop our Engineers to be well equipped for the future and possibly reduce the likelihood of brain drain from ever taking place.



New Books In Our TEEAM Library

New arrivals including informative reference materials are available in our Library. The Library is open to TEEAM members from 9.00 a.m. to 5.45 p.m. from Mondays to Fridays.

Title : Master Builders' Journal Vol 3/2015
Publisher : Master Builders' Association of Malaysia

Title : Berita KLSCCCI, 10-12 (356), 1-3 (357)
Publisher : KLSCCCI

Title : CIDB Malaysia, HEIGHTS Vol. 2, 2015
Publisher : CIDB

Title : Malaysian-German Chamber of Commerce and Industry,
25th Anniversary (1991-2016) Souvenir Book
Publisher : MGCC

Title : IEEMA Members' Directory 2016
Publisher : IEEMA

Title : IEEMA Journal, Issue No.10 & 11, 2016
Publisher : IEEMA

Title : EUMCCI Review, Your Partner for EU-Malaysia Business,
Vol. 4/No. 1/2016
Publisher : EUMCCI

Title : TRADE MART, Volume 1/2016
Publisher : Matrade Publication

Title : ACCCIM Bulletin, February 2016 & April 2016
Publisher : The Associated Chinese Chambers of Commerce and Industry of Malaysia

Title : Business Action @ FMM, Jan-Mar 2016, Apr-Jun 2016
Publisher : Federation of Malaysian Manufacturers

Title : Berita MFPA, We Protect Mankind and the Environment,
March 2016 Edition
Publisher : The Malaysian Fire Protection Association

Title : Jurutera, May & June 2016
Publisher : Institution of Engineers, Malaysia

Title : The Ingenieur, Vol. 66, April-June 2016
Publisher : The Board of Engineers, Malaysia

Title : MGCC Perspectives, Vol. 22, No. 3, May/June 2016
Publisher : The Malaysian-German Chamber of Commerce and Industry

Title : DENKI, No. 784, June 2016 issue
Publisher : The Japan Electrical Manufacturers' Association

Title : The Directory of Malaysia Mould & Die, 2016-2017,
Edition No. 9
Publisher : Malaysia Mould & Die Association

Title : The Report Malaysia 2016
Publisher : Oxford Business Group

Title : Focus Malaysia, Weekly Issue 290, July 23-29, 2016
Publisher : Focus Malaysia Sdn Bhd



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Scope of packaging and transportation testing laboratories



Other primary and secondary packaging products which can be tested comprise of plastic films, woven plastics, composite packaging, shipping containers, pallets, boxes, palletized packaging, metal/fibre drums, plastic jerrycans, bags of paper, flexible/composite intermediate bulk containers, packages etc.

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- Sling type drop tester
- Top lift FIBC tester
- Temperature and humidity chamber
- Hot chamber
- Walk in cold test chamber
- Walk in humidity test chamber



APPLICATION PROCESS

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2. Issuance of Quotation
3. Application
4. Submission of Test Sample
5. Product Testing
6. Issuance of Test Report

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Hybrid Visible Light Communication System

This article is written by Mr Teo Yow Chuan, Ms See Lee Nee and Dr Tan Ching Seong from the Faculty of Engineering, Multimedia University

Electrical Accidents

High efficiency solid state lighting technology is developing rapidly due to nanomaterial development. Visible light is emitted when an electric current passes through Light Emitting Diodes (LEDs). Currently, LEDs are employed as an alternative light source for major domestic lighting applications due to high energy efficiency, outstanding reliability and low production cost. Two fundamental properties are provided by LEDs, which are lighting illumination and optical power transmission. Demand of user data services increased tremendously due to growth in the adoption of electronics devices such as smart phones, laptops and devices on the “Internet of Things”.

A wireless network has to provide better spectrum efficiency or increase its capacity. However, most of the network spectrum is already allocated. Based on the Cisco Visual Networking Index, global mobile data traffic grew 74 percent in 2015 and reached 3.7 Exabytes per month. Moreover, the mobile connectivity based on Radio Frequency will create interference problems between devices communicating in close proximity. Visible Light Communication (VLC) is thus emerging as a viable solution for overcoming limited spectrum phenomena. 380nm to 780nm unregulated and unlicensed visible light spectrum is employed by VLC to achieve high speed data transmission, through Intensity Modulation and Direct Detection (IM/DD). Another benefit of VLC is its affordable cost. It is observed that the VLC system is cheaper than WiFi + Lighting over MBPS data.

Why Hybrid VLC?

Although VLC contains several benefits when compared with Radio Frequency (RF) in indoor conditions, some challenges still need to be addressed. Duplex communication can be problematic due to the illumination light source of VLC being used naturally for downlink broadcast purposes and intrusive uplink irradiance from electronic devices may interfere with the downlink. Moreover, optical transmission can be easily blocked by non-transparent objects and result in the instability of the system. In addition to that, Line-Of-Sight (LOS) for duplex VLC transmission should be applied in order to trace the optical signal. VLC data transmission can be lost due to rotation of the user's receiver. Since all the topics mentioned above are still open topics and with seamless coverage being hard to achieve, the idea of a combination of VLC and RF for indoor electronic devices is being proposed.

Proposed System Architecture

Thus, we have proposed a hybrid VLC system as shown in Figure 1. This hybrid VLC system consists of a transmitter, Raspberry PI, microcontroller unit (MCU), transmitter and receiver circuit, and a receiver. In this system, a transmitter will send data in serial mode and the MCU will modulate the signal by using Manchester coding. Next, the TX circuit will transmit the data through the optical link (VLC). On the other hand, the RX circuit will receive the data signal and demodulate it by the MCU. However, when the receiver is out of sight, the Raspberry PI will provide serial interface through the USB-Serial converter and transmit data through Wi-Fi.

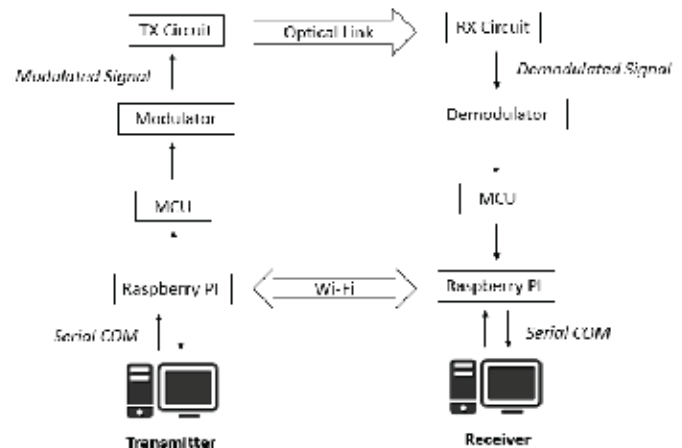


Figure 1: Proposed System Architecture

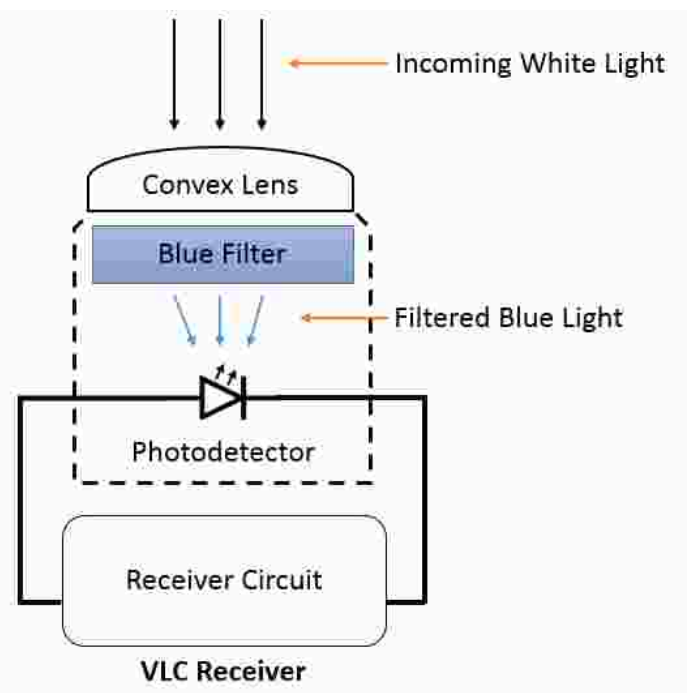


Figure 2: The VLC Receiver

Figure 2 shows the block diagram of the VLC receiver. The convex lens is used to increase the incoming white light intensity. The incoming light is filtered so that only blue light can be passed through and captured by a high speed Si-PIN photodiode. The photodiode is connected to the receiver circuit.

Result and Discussion of Current Research

In our research, our hybrid system is set up as shown in Figure 3. We have conducted a Packet Error Rate (PER) experiment with the VLC (optical link) by sending different file sizes over several distances between the transmitter and receiver. The file sizes are 1kb, 3kb, 5kb, 10kb and 20kb. Each file size is repeated for all the distances of 50cm, 75cm, 100cm, 125cm and 150cm.



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TEEAM at SMIDEX 2016

SMIDEX 2016, the 18th SME Annual Showcase, was successfully held from 17th to 19th May 2016 at the Kuala Lumpur Convention Centre. The 3-day exhibition was co-organised by SME Corp Malaysia and the Ministry of International Trade and Industry (MITI). It was supported by numerous trade associations including TEEAM.

SMIDEX 2016 enabled local and international players to showcase a broad diversity of products, services and technology ready for the global market. There were some 350 local and overseas exhibition



At our TEEAM booth – (from left) Mr Cher Dong Theng (SIRIM), Mr Stanley Teo (SIRIM), Ms Clarissa Chin (FMM), Mr Suresh Kumar Gorasia (TEEAM) and Mr Rajasegaran Naidu (Saturn Pyro).



Impressive – Malaysian LED Companies.

booths including the international pavilion. Besides the local manufacturers and suppliers, the Government agencies and trade organisations also actively participated. There was indeed a strong presence of foreign companies in the international pavilion.

The 3-day event included a wide array of programmes ranging from industry Talks and Seminars, industry Forums and Business Matching Sessions. It was a great platform that offered invaluable experience for visitors to meet a wide range of manufacturers and service providers all housed under one roof.



Celebration of SMEs' 20 years – Welcome remarks by Deputy Minister, Y.B Datuk Hj. Ahmad Maslan representing the MITI Minister.



TEEAM's Booth – Manned by Secretariat Staff, Ms Sherly Cheong



Hybrid Visible Light Communication System (Continued)

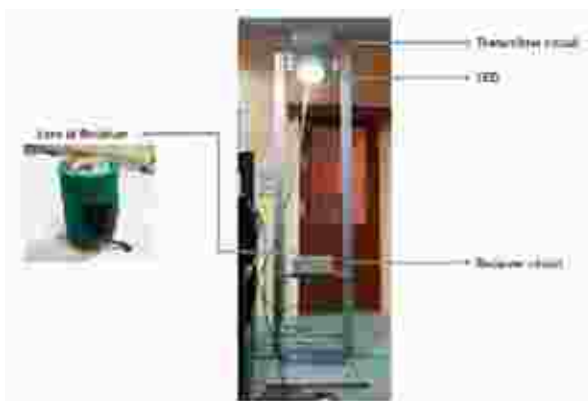


Figure 3: The current research hybrid VLC system

The results of the experiment has been tabulated as follows:-

Data Rate (relative scale)	Distance (cm)				
	50	75	100	125	150
1	1052	1052	1052	1052	-
3	2585	2582	2090	1822	-
5	5255	5255	4065	4305	-
10	10699	10699	9939	9369	-
20	21460	21270	21243	19370	-

Table 1: PER calculation

As we can see from the table above, the PER is 0% for all distances when sending a file size of 1kb. The receiver receives all the packets (PER=0%) at the distance of 50cm for all file sizes. However, there are some loss of packets when the distance is increased to 75cm and onwards. The packets are being sent through Wi-Fi, when the distance is at 150cm.

Conclusion and Future Work

In this article, we have proposed the design and implementation of a hybrid VLC system that communicates in serial form. We have analysed the PER and the maximum distance that can be achieved between the transmitter and receiver, is 125cm.

As future work, we expect to extend our hybrid VLC Research by encompassing the dynamic handover and traffic-routing based on real-time measurements of the VLC channel. We also hope to improve the performance of the system by increasing the distance between the transmitter and receiver.

Mr Teo Yow Chuan, Ms See Lee Nee and Dr Tan Ching Seong are from the Faculty of Engineering, Multimedia University (MMU). Dr Tan is an Associate Professor at MMU. Both Mr Teo & Ms See are students of MMU. They can be reached at E-mail: cstan@mmu.edu.my



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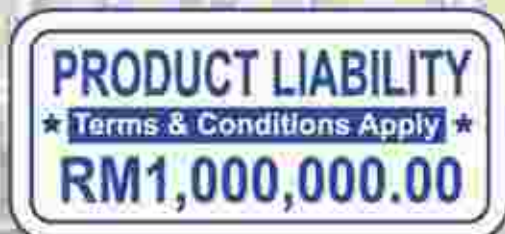
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Cable & Wire Indonesia 2016

A large number of visitors flocked Cable & Wire Indonesia 2016 which was held from 18th to 20th May 2016 at Jakarta International Expo Kemayoran, to catch what were the latest technological innovations in cable and wire manufacturing. The event was held alongside Inagreetech, Inatronics, Inalight, Solartech, Power Gen and Battery Exhibitions. This grand seven-in-one exhibition was ASEAN's largest Trade Show for Green Technology, Lighting, LED, Solar Panel, Electronic Components, Battery, Cable & Wire, Power Generation and Eco-friendly Products.

It witnessed over 500 exhibiting companies from 14 different countries. TEEAM was invited by the Event Organiser, GEM Indonesia, to participate in the above industry-leading event. It was a truly good exposure for our TEEAM delegates to the opportunity-rich Indonesian market.



Supportive – Covis Sdn Bhd participated with TEEAM at Cable & Wire Indonesia 2016. Seen here are (left) Mr Lawrence Lai and Ernest Yong.



Seeking potential market – Infinite Power Sdn Bhd also made its presence felt.



Engrossed – Technical seminar in progress.



Interesting – A section of the exhibition area.



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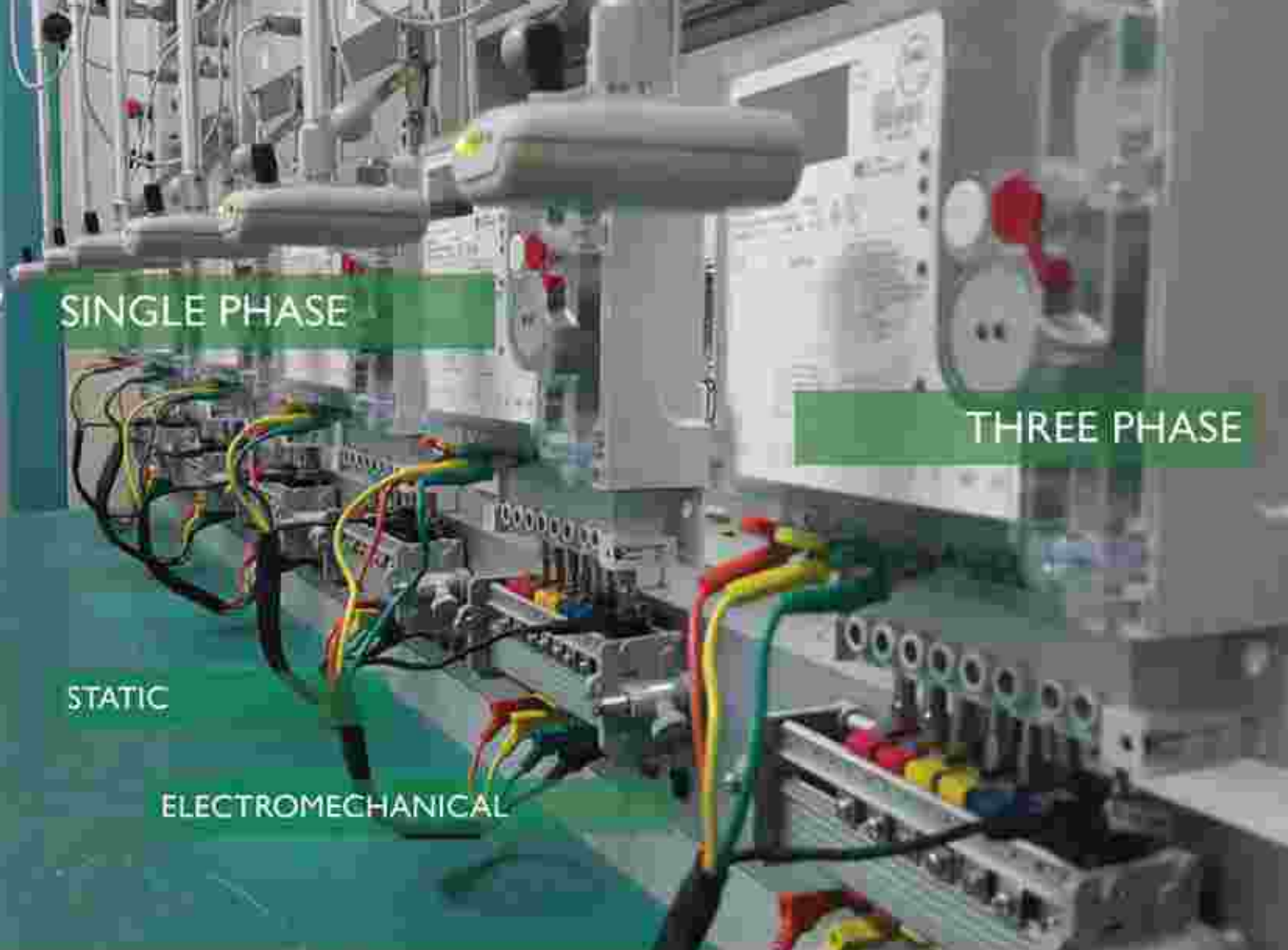


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Challenges and Opportunities in the Electrical Industry – Part 26

This article is written by Ir Chew Shee Fuee KMN, TEEAM President

A) RCDs or RCCBs?

Since there is a difference in using the term RCD and RCCB, it will be better for us to agree to the usage of a common term. In this regard, I propose that we henceforth use the term RCD.

10 Different Types of Residual Current Devices (RCDs):

#1 RCCB

(Residual Current-Operated Circuit-Breaker without Integral Overcurrent Protection)

It is a mechanical switching device designed to make, carry and break currents under normal service conditions, and to cause the opening of the contacts when the residual current attains a given value under specified conditions. It is not designed to give protection against overloads and/or short-circuits, and must always be used in conjunction with an overcurrent protective device such as a fuse or a circuit-breaker.

#2 RCBO

(Residual Current-Operated Circuit-Breaker with Integral Overcurrent Protection)

It is a mechanical switching device designed to make, carry and break currents under normal service conditions, and to cause the opening of the contacts when the residual current attains a given value under specified conditions. In addition to that, it is also designed to give protection against overloads and/or short-circuits. It can be used independently of any other overcurrent protective device within its rated short-circuit capacity.

#3 SRCD

(Socket-Outlet incorporating a Residual Current Device)

This is a socket-outlet for fixed installations incorporating an integral sensing circuit that will automatically cause the switching contacts in the main circuit to open at a predetermined value of residual current.

#4 FCURCD

(Fused Connection Unit incorporating a Residual Current Device)

A fused connection unit for fixed installations incorporating an integral sensing circuit that will automatically cause the switching contacts in the main circuit to open at a pre-determined value of residual current.

#5 PRCD

(Portable Residual Current Device)

A device comprising a plug, a residual current device and one or more socket-outlets (or a provision for connection). It may incorporate overcurrent protection.

#6 CBR

(Circuit-Breaker incorporating Residual Current Protection)

A circuit-breaker providing overcurrent protection and incorporating

residual current protection either integrally (an Integral CBR) or by combination with a residual current unit which may be factory or field-fitted.

Note: The RCBO and CBR have the same applications, both providing overcurrent and residual current protection. In general, the term RCBO is applied to the smaller devices whereas CBR is used for devices throughout the current range, with ratings up to several thousand amperes, single and multi-phase. The RCBO and CBR are more strictly defined by the relevant standards.

#7 RCM

(Residual Current Monitor)

A device designed to monitor electrical installations or circuits for the presence of unbalanced earth fault currents. It does not incorporate any tripping device or overcurrent protection.

#8 MRCD

(Modular Residual Current Device)

An independently-mounted device incorporating residual current protection, without overcurrent protection, and capable of giving a signal to trip an associated switching device.

#9 Voltage Independent RCD

(Voltage Independent Residual Current Device)

A Voltage Independent RCD uses the energy of the earth fault current to trip the mechanism directly. In this type of RCD, the output from the sensing coil operates a specially constructed magnetic relay and so releases the RCD mechanism, independently of the mains voltage.

The Voltage Independent RCD normally uses a polarised (field weakening) relay construction. This operates by cancellation of the permanent magnetic flux (which holds the relay ON) by the excitation flux (produced by the fault current). This can only occur in one half-cycle of the a.c. supply because the magnetic flux will be reinforced in the other half-cycle. Operating times can vary from 20ms to 120ms at the rated tripping current.

#10 Voltage Dependent RCD

(Voltage Dependent Residual Current Device)

A Voltage Dependent RCD generally employs an electronic amplifier to provide an enhanced signal from the sensing coil to operate a trip solenoid or relay. An RCD of this type is defined as 'voltage dependent' because it relies on a voltage source, derived from the main supply, or an auxiliary supply, to provide power to the amplifier. The basic principle of operation is, however, the same as the Voltage Independent RCD.

B) 10mA, 30mA, 100mA RCDs

The time has come to make available various current ratings of RCDs in order to provide the relevant protection mechanisms. Their different applications are discussed below.



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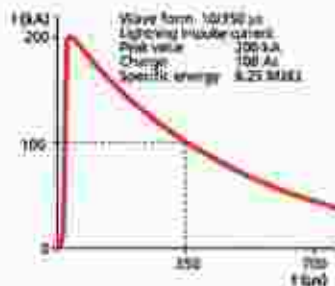
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TILS & LED Taiwan 2016

Taiwan International Lighting Show (TILS) 2016 was held in conjunction with LED (Light Emitting Diode) Taiwan 2016 from 13th to 15th April 2016 at the Taipei Nangang Exhibition Centre, Taiwan. Organised by the Bureau of Foreign Trade, Ministry of Economic Affairs and implemented by Taiwan External Trade Development Council (TAITRA) together with Taiwan Lighting Fixture Export Association (TLFEA), TILS was an excellent platform for buyers to source and do business with Taiwanese lighting suppliers. LED Taiwan was co-organised by TAITRA and Semiconductor Industry Association International (SEMI) Taiwan. In addition to that, Taiwan Solid State Lighting (SSL) 2016 was also held concurrently. It was a buyer-friendly sourcing platform to enable buyers to browse under one roof,

virtually everything regarding lightings, ranging from processing equipment and materials to diverse product applications.

Members of TEEAM were officially invited by TAITRA to visit the Trade Show. Some 748 booths were manned by 238 exhibitors from nine countries, to present a full slate of exhibits relating to lighting. Besides the exhibition, a Lighting Design Conference, One-to-one Procurement Meetings, Product Launches and Technical Seminars were also organised for the benefit of visitors and the exhibiting companies. A special SSL Symposium was held to look into the latest technological developments in LEDs and OLEDs (Organic Light Emitting Diodes). It was truly an exciting event for all trade visitors.



At TILS & LED Taiwan 2016 – (from left) TEEAM officials, Dr Lu Jye Ying, Mr Andrew Lu & Ms Winnie Khong posing with Glacial Light personnel.



Tianxi Optoelectronics – Lovely LED lights!



Attentive participants – Technical seminar to gain important knowledge from the experts.



Challenges and Opportunities in the Electrical Industry – Part 26 (Continued)

(i) 10mA RCDs (Specific protection)

Since our bathrooms are considered wet environments, the application of a 10mA RCD is necessary. It provides much better sensitivity.

(ii) 30mA RCDs (Personal protection)

This is for additional protection of persons or livestock against direct contact. This is ensured when the minimum operating current of the RCD is no greater than 30mA and the RCD operates to disconnect the circuit, within the specified time, in the event of an earth leakage.

(iii) 100mA RCDs (Installation protection)

This is associated with devices that are used to protect against the risk of fire caused by an electrical fault. An RCD which operates at residual current levels up to, and including 300mA, provides this type of protection.

Ir Chew Shee Fuee KMN, B Sc (Hons) (Strathclyde), PEng, CEng, FIEM, MIEE Member, IEEE Member, 1st Grade Electrical Engineer (Competent up to above 500kV).

Ir Chew is the current President of Electrical and Electronics Association of Malaysia (TEEAM). He was TEEAM President for 2001-2003 and 2003-2005. He is the Past President of the Asean Federation of Electrical Engineering Contractors (AFEEC).

Ir Chew is the Managing Director of G H Liew Engineering (1990) Sdn Bhd and QATM Engineering Services Sdn. Bhd. He graduated from the University of Strathclyde, Glasgow with a B Sc (Hons) in Electrical & Electronics Engineering. He is a Professional Engineer and is also licensed by Energy Commission as a competent engineer (without voltage limits) and a service engineer to carry out electrical testing up to a voltage of 500kV.

Ir Chew has more than 30 years experience in electrical control and relay protection. He is also specialised in electrical site tests on power equipment, electrical fault investigation, service and maintenance of electrical switchgear and relays. His work also includes electrical supervisor of substations and electrical audit.

He presents lectures on electrical apparatus and the protection system. He is at present a WG representative in the development of Green Technology Road Map Phase 1. He is also a member of the National Energy Efficiency Technical Working Group. He is the Immediate Past President of IET Malaysia (Institute of Engineering & Technology) and Board Member of IET's APRB (Asian Pacific Region Board).

He can be reached at E-mail: sfchew@ghliew1990.com



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Malaysia Moving Towards Quality LED Lightings with Enforcements

This paper is prepared by Mr Lim Sai Seong, QAV Technologies Sdn Bhd

For years, LED (Light-Emitting Diode) innovations had been introduced to our Malaysian market through various applications. From the Aerospace, Automotive, Medical Field, General Lighting and a host of other industries, all these LED applications of lightings, basically change the day-to-day perception of people from the different age groups. The applications of LED are very extensive. Nowadays the applications of LEDs are not limited to professional use only. LED lightings are accessible to end-users for application in their homes, offices and for other purposes such as for decorative uses. LED which was once a technology that was only used by professionals for professional usage, is now easily available off the supermarket racks. Today, my article will be emphasizing on how our Malaysian authorities govern the usage of LED general lighting products in Malaysia, plus ensure that it is safe for use and benefits the end-user.

As one of the leading countries in LED general lighting innovations, and amongst one of the first countries in Asia that had successfully implemented LED lightings for households and also road lightings, Malaysia had taken several praiseworthy initiatives and counter-measures to ensure the product delivered to the end-users (either household users or professional users) come with the proper safety standards, are safety-ensured and also performance-ensured. In general, lightings are categorized into two main categories. They are the Luminaires and Lamps. Luminaires are basically integrated lighting in a casing or fitting, for example, self-ballasted LED town lights, street lightings, high bays, etc. The second category would be lamps, whereby they are usually retrofitted lightings, for example E27/E14/GU10 bulbs, G13 T8 LED tubes, etc.

In Malaysia, there are two main bodies that govern the usage of LED lighting products. For household applications, our Malaysian Energy Commission is tasked with governing it. An import permit (Certificate of Approval, COA) is needed in order to import the relevant products. The control lists and requirements are listed below:

Category	Detail of Equipment	Domestic Standards	International Standards
LED Lighting	Lamp controlgear: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules	MS IEC 61347-1:2012 MS IEC 61347-2-13:2012	IEC 61347-1:2010 IEC 61347-2-13:2006
	LED Lampholder (Connectors for LED -modules)	MS IEC 60838-1:2008 MS IEC 60838-2-2:2008	IEC 60838-1:2004 IEC 60838-2-2:2006
	LED Modules for general Lighting (eg. double capped self-ballasted LED Lamp)	MS IEC 62031:2011 with MS IEC 60061-1:2005	IEC 62031:2008+A1, A2 with IEC 60061-1:2005
	Self-ballasted single capped LED-lamps for general lighting services by voltage > 50V	MS IEC 62560:2012	IEC 62560:2011

Table 1: Extracted from Page 20 of the Energy Commission, Information Booklet 2014 Edition, Approval of Electrical Equipment.

The above table generally covers the necessity of testing according to IEC and/or MS standards in order for one to import the LED-based products into Malaysia. The testing included the relevant safety tests to ensure the basic safety of the lightings from the electrical and mechanical aspects, in order to prevent unwanted incidences from happening during the process of installation, operation and even during the occurrences of fault conditions.

Besides safety tests, the Energy Commission has also stated the needs of Minimum Energy Performance Standards (MEPS) testing for all of the declared energy-saving products. With this regulation, the fast degradation of the lighting level (lux/lumens) and overnight failure of LED lightings plus the accompanying emissions, are duly addressed. The requirements of the minimum efficacy of the lamps are shown below:

Lamp cap type (as in MS IEC 60061-1)	Minimum efficacy (lm/W)
G13	75
GU10	50
E27 or B22d	60
E14	60

Table 2: Page 4 of Malaysia Standards, MS 2598, Minimum energy performance standards (MEPS) for lamps.

Inside the MEPS requirements, besides meeting the minimum efficacy level, the lighting itself will also need to fulfill the lumens maintenance level specifications and also to ensure that the failure rates are controlled according to the requirements as stipulated below:

- the performance testing standards shall be in accordance with MS 62612 (P);
- LED lamps shall be tested for 6000 h according to MS 62612 (P), with a minimum 70% of the initial lumen output value and a failure rate of not more than 10% of sample population;
- the endurance parameters for testing as with i) above, shall be not less than 80% of the initial lumen output value and a failure rate of not more than 10% of sample population after a minimum of 1000 h of operation;

On the other hand, for professional products which are used in federal works, public works, certain commercial buildings or projects, etc, these are governed by Malaysia's Jabatan Kerja Raya (JKR), namely the Public Works Department (PWD). As for highways, it is duly governed by Lembaga Lebuhraya Malaysia (LLM), also known as the Malaysian Highway Authority (MHA). In order to fulfill JKR's requirements, the road lightings must meet the following testing requirements according to the LS-20 guidelines shown below. As for the other lighting products, JKR guidelines are also available, namely, the LS-1 and its series.

In conclusion, Malaysia is moving forward to a new era of green products, doing its part in helping to reduce the carbon footprint. In order to ensure the products used by household consumers and professionals are quality-ensured, the relevant standards and

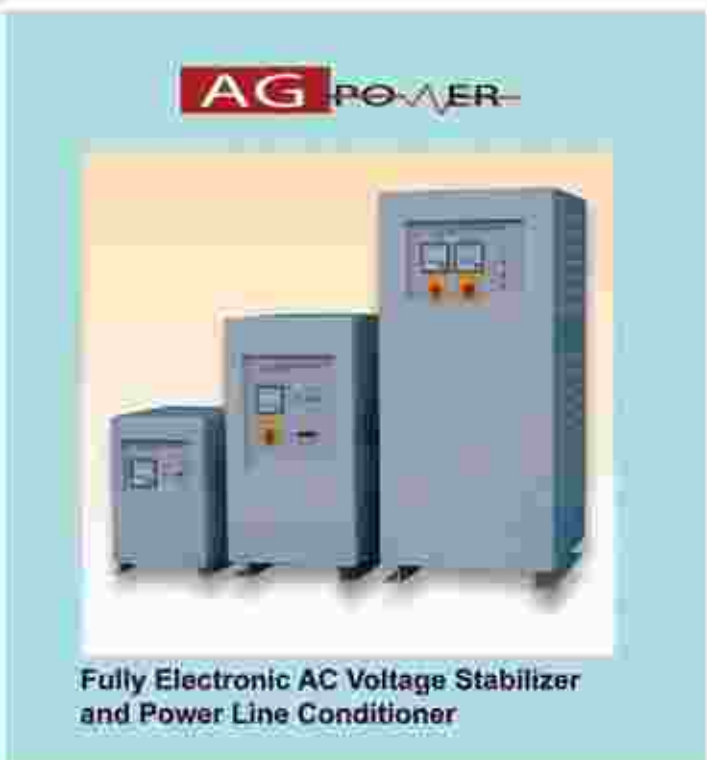
Accessories



Connector, Multi Range Line Tap, Phase Distribution Block.



Protector Trip Relays.



No.	Item	Relevant IEC Standards	Name of Standard
1.0	Luminaire		
1.1	Safety	MS IEC 60598-2-3	Luminaires – Part 2-3: Particular Requirements – Section 3: Luminaires for Road and Street Lighting
1.2	Performance	MS 62722-1	Luminaire Performance – part 2-1: Particular Requirement for LED Luminaires
1.3	Performance	IES LM-79-08	Approved Method: Electrical and Photometric Measurements of Solid State Lighting Products
1.4	Performance	IES TM 21-11	Projecting Long Term Lumen Maintenance of LED Light Sources
2.0	Control Gear (LED Driver)		
2.1	Safety	MS IEC 61347-2-13 IEC 61347-2-13	Lamp Control Gear – Part 2-13-Particular Requirement for DC or AC supplied Electronic Control Gear for LED Modules
2.2	Performance	MS IEC 62384 IEC 62384 ed 1.1	DC or AC supplied Electronic Control Gear for LED Modules – Performance Requirements
3.0	Lamp Holder		
	Safety	MS IEC 60838-2-2 (IEC 60838-2)	Miscellaneous lampholders – Part2-2-Particular Requirements – Connectors for LED Modules
4.0	LED		
4.1	Term & Definition	MS IEC 62504 IEC 62504 (Ed.1)	General Lighting: LEDs and LED Modules – Terms and Definition
4.2	Performance (General)	IEC / PAS 62707 Ed.1	LED – Binning – Part 1: General Requirements and White Grid
4.3	Performance (Modules)	MS 62717	LED Modules for General Lighting-Safety Requirements
4.4	Performance (Lamps)	IEC/TR 61341	Method of Measurement of Centre Beam Intensity and Beam Angle(s) of Reflector Lamps
4.5	Performance (Light Source)	IES LM-80-08	Approved Method: Measuring Lumen Maintenance of LED Light Sources
4.6	Safety (Modules)	MS IEC 62031 IEC 62031 (Edition 1.0) AMD.1.ed 1	LED Modules for General Lighting-Safety Specifications
4.7	Safety (Lamps)	IEC 61231	International Lamps Coding Systems
4.8	Safety (Eye Protection)	IEC 62471 ed 1.0	Photobiological Safety of Lamps and Lamp Systems
4.9	Safety (Eye Protection)	IEC/TR 62471-2	Photobiological Safety of Lamps and Lamp Systems – Part 2: Guidance on Manufacturing Requirements Relating to Non-Laser Optical Radiation Safety
10.0	Connector		
	Safety	IEC 61984	Connectors- Safety Requirements and Test
11.0	EMC		
11.1	Performance	IEC 61547 Edition 2.0	Equipment for General Lighting Purposes – EMC Immunity Requirements
11.2	Performance	IEC 61000-3-2 Edition 3.2	Electromagnetic Compatibility (EMC) – Part 3-2: Limits – Limits For Harmonic Current Emissions (Equipment Input Current <16 A per phase)
11.3	Performance	CISPR 15:2005 (BS EN 50015)	Limits and Methods of Measurement of Radio Disturbance Characteristics of Electrical Lighting and Similar Equipment
12.0	Lighting Design		
12.1	Performance	MS 825	Code of Practice for The Design of Road Lighting

Table 3: Page 1,2 and 3, Addendum No 1 to Specification for Road Lighting Installation, Revision 1, JKR

requirements (Safety and Performance) are being enforced in our Malaysian Act. Last but not least, in order to boost the growth of this industry, local testing laboratories (such as SIRIM and QAV Technologies Sdn Bhd) are being developed to fulfill the National Testing Requirements' agenda.

Mr Lim Sai Seong is a Director of QAV Technologies Sdn Bhd / QAV Test Technologies (KL) Sdn Bhd. He is also the Assistant Honorary-Secretary of The Electrical and Electronics Association of Malaysia (TEEAM) and Treasurer of Malaysia Commission of Illumination (MyCIE). He can be contacted at Email: sslim@qavtech.com



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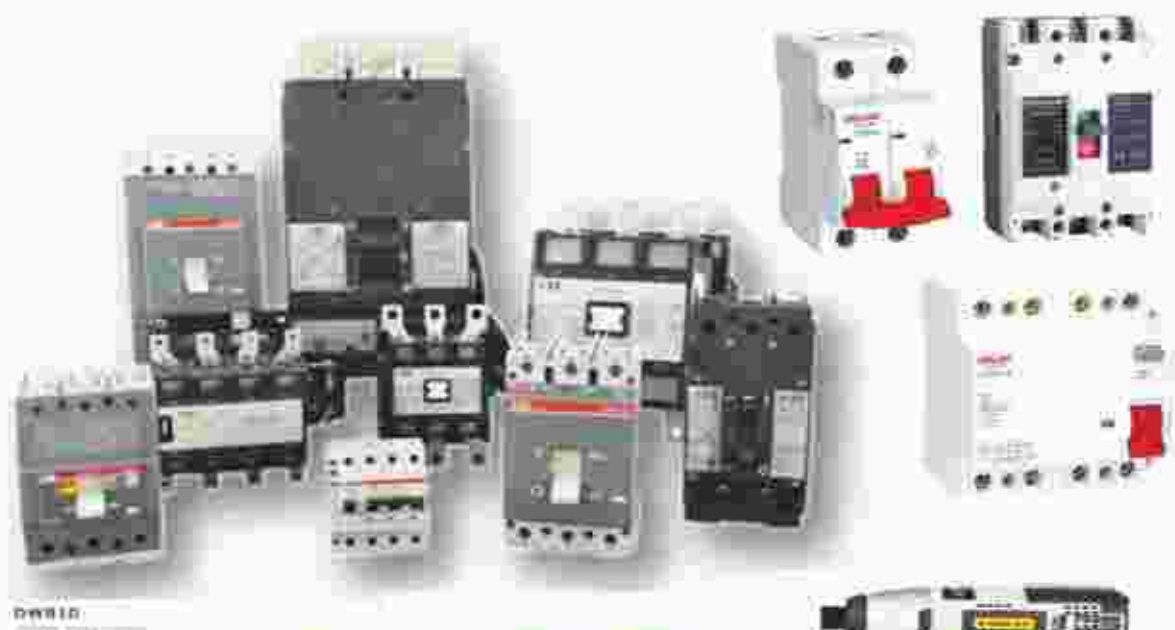
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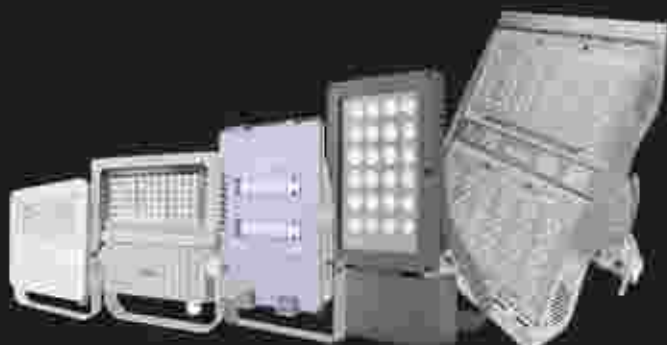
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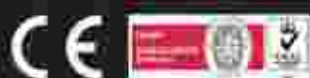
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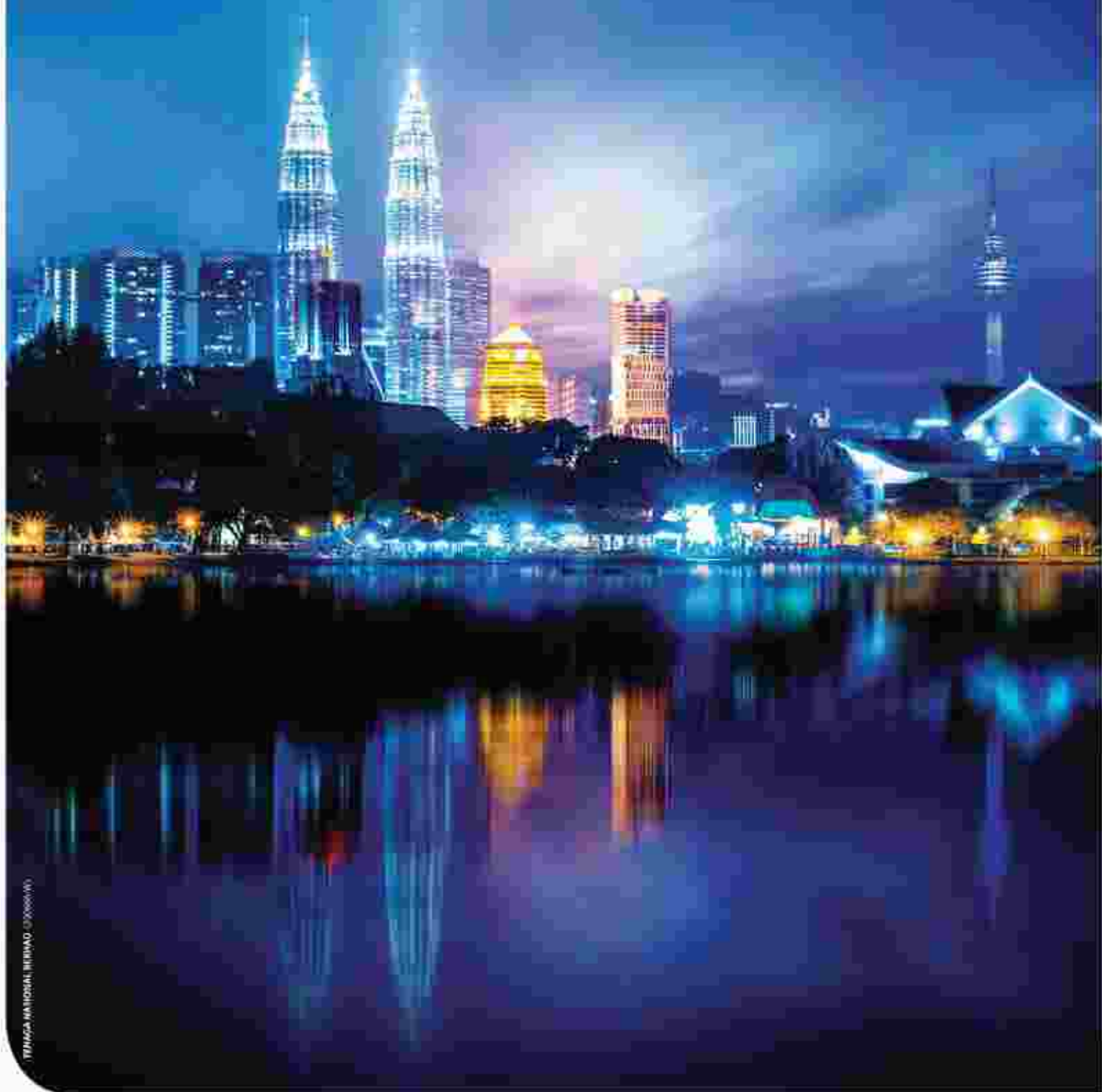
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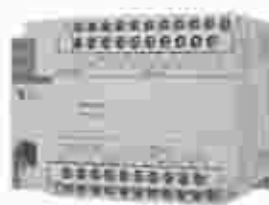
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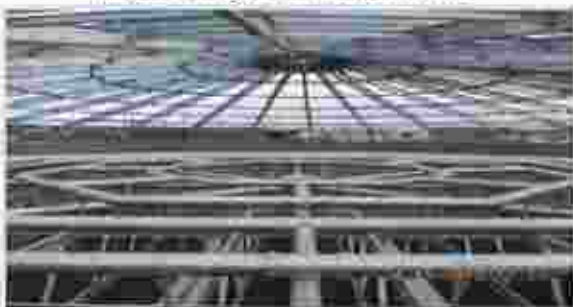
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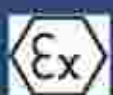
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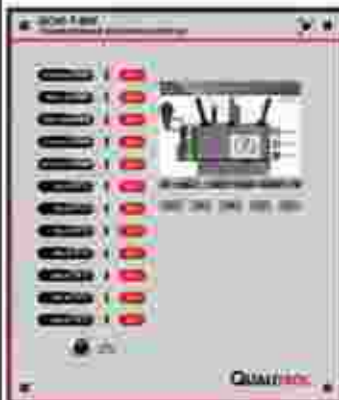
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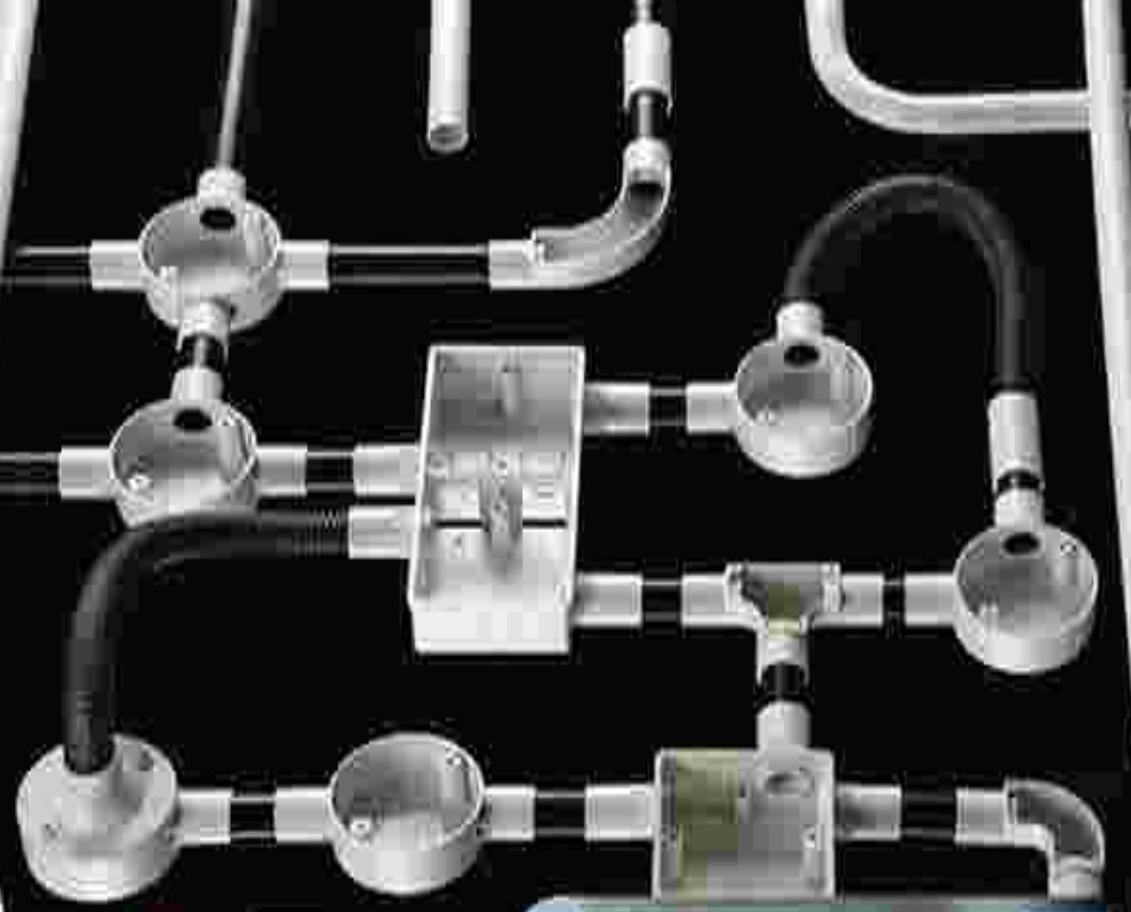
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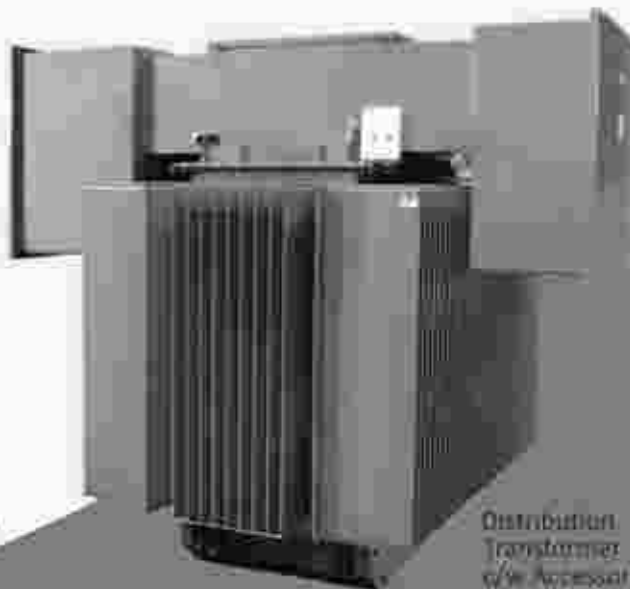
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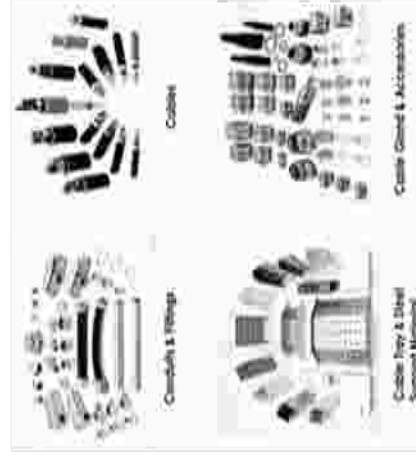
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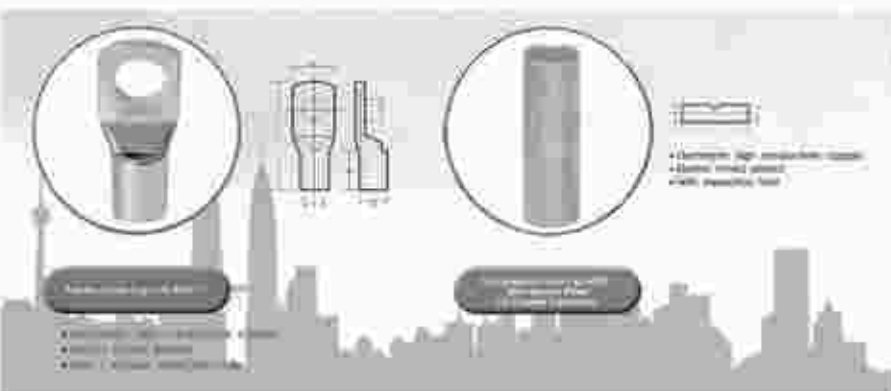
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